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CLINICAL LESSONS FROM PRISONER OF WAR HOSPITALS IN THE FAR EAST (BURMA AND SIAM).¹

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THE title of this paper may suggest that I seek to teach; such is not the case. After three and a half years of general medical and surgical practice in Japanese prison camps it is hardly likely that there would be any world-shaking discovery to record. The reports of one's own progress in the study of disease by the unaided senses may be of interest.

This paper is divided into two parts: (a) a narrative in brief of personal experiences from February, 1942, to February, 1944, which includes the stormy period in the railway construction camps; (b) a description of the organization of the Nakompton prisoner of war hospital, a picture frame in which my colleagues Dr. Dunlop and Dr. Marsden will supply some detailed sketches. In the first period I was a Jack-of-all-trades, in the second I combined medical administration with my own speciality, surgery.

The experiences recorded were, in part, common to a number of medical officers of the Australian, British, Dutch and American Medical Corps. There was some geographical diversity in that prisoners of war were scattered over a wide area. I shall first of all briefly explain my own pilgrimage (see map).

PART I.

Leaving Singapore as a medical evacuee, I found myself in the company of a number of administrative and specialist members of the Royal Army Medical Corps and

the Indian Medical Service, eleven of us altogether. After an eventful voyage we were landed by a small rescue boat on February 15 on the east coast of Sumatra, where three of us, an Irishman, Lieutenant-Colonel Hennessy, a Scotch lad, Major Kilgour, and myself, established a temporary casualty clearing station in a village, Tembilahan, for the reception and the treatment of wounded from ships which had met a similar fate to our own. Fetching up on the west coast of the island at Padang sixteen days later with our prizes, that is, wounded men and women of all services, British, Australian and Indian, we awaited the arrival of a ship to take us off. The non-appearance of the ship left us a sitting prey to the Japanese who arrived in Padang on March 17. This is not the time or place to give a detailed account of the happenings during the month or more of our exodus from the Malayan theatre.

After a sojourn of six weeks in Padang, during which time late operating was done on the wounded castaways in the local military and the Salvation Army mission hospitals, I was sent with 500 British prisoners of war to Burma. Hennessy remained at Padang with 500 to 600 prisoners of war, including 100 Australians. Kilgour, who pushed off in a small boat the night before the Japanese came, lost his life after nine weeks at sea.

We voyaged by the Japanese transport *England Maru* to Mergui, Burma. Conditions in the ship were bad. Dysentery broke out. There were no drugs of any kind available. At Mergui we joined a portion of "A Force", Australian prisoners of war. I was a victim of amoebic dysentery soon after my arrival, and was treated with emetine in the possession of my colleague, the late Major John Chalmers. This small supply soon ran out and later sufferers from the disease at Mergui were treated with charcoal from the kitchen. About twenty died, nearly all of them from my party in Sumatra. We had undoubtedly contracted the disease on that island. This acute fulminating form of amoebic dysentery was not generally appreciated by some of our physicians in other

¹ Read at a meeting of the Victorian Branch of the British Medical Association on February 6, 1946.

camps, but I have no doubt that the Burmese doctor's opinion, based on the microscopic examination of stools, together with the therapeutic effects of emetine in those who fortunately had it and the later course of the survivors, confirmed the diagnosis. We learned that amœbic dysentery occurs not only as a chronic slowly developing disease, but in explosive fulminating epidemic form.

In August, 1942, my medical party proceeded to Tavoy, and here for the next five months we had a relatively quiet time, the only outstanding incidents being (a) the first operation for chronic dysentery in an up-country prisoner of war camp and (b) an urgent call for help by a Japanese surgeon.

A Dutch doctor in the camp asked for my help with a patient who had been ill with dysentery for six months. He was then having sixty motions a day, passing blood and pus. He was rapidly deteriorating. No medical treatment had availed. Emetine was not procurable; the patient was known to have a mixed infection. I performed an ileostomy. He recovered and later worked for me as a medical orderly, doing the heaviest work while wearing a Dutch water bottle as a receptacle. Two years later I closed the ileostomy at Nakompaton.



New arrivals. Dressing ulcers, Chungkai.

The Japanese doctor in charge at the civil hospital got into trouble while attempting an appendicectomy; he sent urgently for me by car. The conscious patient, a Japanese, having had a little local infiltration of the abdominal wall, was held down by orderlies, screaming with pain, and several feet of purple small gut were strangled through a misplaced incision. The worried Japanese handed over to me. When the bowel was returned to the abdomen and I presented the appendix to the Japanese surgeon, he triumphantly removed the little organ and churlishly brushed me aside; he at least had saved half his face. He did not get rid of me without promising drugs, which he later supplied by raiding the civil hospital dispensary.

In February, 1943, my party moved to Thanbyuzayat, the Burma end of the Siam-Burma railway. Major W. E. Fisher was in charge of the base hospital there and Lieutenant-Colonel T. Hamilton was senior medical officer. I took over temporarily a ward of patients with foot and eye conditions. The eye conditions will be left to others to describe. They were well known in Changi, where more facilities were available for their study by specialists such as Dr. Robin Orr. As for the painful feet, I had seen an occasional somewhat similar condition in civil practice, generally known to us as erythromelalgia. The foot was pinkish blue in colour and sweated freely; pulsation of the palpable arteries was marked. Nocturnal pain of a severe aching character frequently kept the patient on his feet all night. No treatment apart from the provision of eggs and bananas in the diet was possible. The deficiencies in the Japanese rations at the time were

particularly protein, fat (of which there was none) and vitamins, especially the B complex. Little true beriberi was seen at that time, although a few cases of foot drop, absent reflexes and anaesthesia of the legs were noted. I was prevailed upon by the physician in charge of one patient with painful feet in a very severe form to try a neurectomy of the foot as practised occasionally in Buerger's disease. Relief was obtained by section of the tibial and superficial peroneal nerves which were found at operation to be very swollen. Microscopic section was not possible. Speculation on the cause of the condition is not very profitable; no biochemical or other facilities were available. It may have been a phase of pellagra, of which disease we were soon to have a big experience.

In March, 1943, I took over the care of 2,000 sick at Retpu. After a short life of six weeks that place was closed, the dying being sent to the base hospital and the rest back to work on the railway. The Crimes Commission has the appropriate Japanese earmarked for that affair.

Being then sent to a working camp, I spent two weeks observing conditions at first hand at the 75 kilometre mark. The work of the regimental medical officers in looking after the men was excellent. The doctors in that large camp were doing a man-sized job. The daily clash with the Japanese guards for the body of a sick prisoner of war, the unremitting care and patience in listening to complaints, the detailed physical examination where possible, the kind and gentle manner of these doctors (Australian) contrasted strongly with the brutality of the Japanese commander and the visiting Japanese medical officer. I was proud to be associated with doctors with all that that word implies in our western minds.

The camp was emptied of all men able to walk and then converted into a sick depot; the remaining three hundred really sick left on my hands alone were a problem. Amœbic dysentery, relapsing malaria (some cerebral), tropical ulcers, suspected cholera, corneal ulcers and scrub typhus were among the diseases that I was called upon to treat without any drugs except a certain amount of quinine. One could diagnose some conditions, for example, a mass in the right iliac fossa and a distended abdomen, and prognosticate an early perforation of the bowel. One had the grim satisfaction of an intellectual exercise. There was no surgical equipment, so that even the crudest mechanical relief could not be afforded.

On the day on which I went down myself with tropical typhus a Dutch doctor providentially turned up out of the blue. All medical orderlies were sent to work on the railway, if not retained at Thanbyuzayat. There were two sick members of the Fourth Casualty Clearing Station with me. One died of hemorrhage after being sent to the base hospital with amœbic dysentery; the other survived the journey. Of a truck-load of 35 who left that camp for the base hospital, only one is alive today. Being marooned in that sick depot in the wet season with a crowd of seriously sick, and being ill myself, I took comfort from the splendid fellows, Australian and Dutch, recovering patients, around me. Two Dutch boys nursed me in my bamboo bed, and my batman, Buckley, cared for me like a mother. They carried me on a stretcher on July 12 to Kohn Kuhn at the 55 kilometre mark to take charge of an abandoned camp which was set apart by our Japanese custodians as a hospital for the really serious sick.

Many Australians will remember this hospital. I shall describe it in some detail, as it was the main sick depot in Burma and the last resting place for 300 of the victims of the Japanese brutality and neglect in the railway holocaust of 1943. It consisted of eight large and one small atap-covered bamboo huts. The floors were of bamboo. There were no beds or bedding and the patients lay packed together cheek by jowl in their rags and tatters. The small hut was for infectious cases, was known as the "dead house" and contained a hundred dysentery patients.

On my arrival at Kohn Kuhn there were 1,800 patients, mostly Australian and Dutch, two doctors and six medical orderlies. A month later four more doctors and medical orderlies arrived. A Dutch officer, Lieutenant-Colonel

Gottschall, was the prisoner of war commander. An Australian, Major O'Brian, was the adjutant. Gottschall later died in the camp.

Time does not permit of a full history of this camp. A few outstanding points will be recorded. The most common disease was malaria, relapsing and untreated. Quinine supplies were given us for 300 patients, that is, those admitted with the diagnosis of malaria, but as the disease was almost universal, it was a debilitating background of other diseases. A man might have pellagra, ulcer of the leg and malaria. Anaemia, splenomegaly and hepatomegaly were widespread. There was no microscope at first. Clinical findings alone, the history, and one's rapidly widening experience were a guide in diagnosis. Post-mortem examinations were regularly conducted and morbid anatomy was carefully studied. I ordered a malarial survey of all patients in this camp by Dr. T. le G. Brereton, Australian Army Medical Corps. He supplied valuable information which enabled us to give the drug quinine to the most deserving patients. A proper course of quinine was given, the orderly standing by to see the patient swallow the tablets or mixture. A small amount of hydrochloride was available for intravenous use in cerebral malaria. The husbanding of our limited supplies of quinine for the patient desperately in need of the drug indirectly saved lives.

Amoebic Dysentery.

Post-mortem examination in twelve cases of amoebic dysentery showed sloughing of the lower part of the colon, ulceration and sometimes gangrene up to, but never beyond, the ileo-caecal valve, occasional adherent masses in the right iliac fossa and perforation. Proctoscopic study was done in all cases in which the patient passed blood and slime; a tin proctoscope inserted with the patient in knee elbow position and sunlight reflected by a mirror enabled the rectum in its entire length to be examined, that is, little less than is seen with a sigmoidoscope. Valve ulceration was often seen, and transverse ulcers covered with lymph, healing ulcers and small strictures were observed. Most patients gave evidence of the disease in the left side of the colon and rectum whether or not the right side of the colon was affected. One's requests for emetine were met by the Japanese medical officer to the effect that we had no amoebic dysentery, that we could not tell what they were as we had no microscope, and that the term amoebic dysentery must be deleted from thirty death certificates and replaced by the term hill diarrhoea. On further protests, a demonstration of the deep penetrating ulcers as found in autopsy and a visit from the Japanese Lieutenant-Colonel Nagatomo, this officer sent out a circular informing us that he was doing all he could to get emetine. A microscope was brought to the camp when the base prisoner of war staff came there in October, and Lieutenant-Colonel Larsen, Dutch Army Medical Corps, confirmed the diagnosis of amoebic dysentery in most of the surviving suspects. Lieutenant-Colonel T. Hamilton, Australian Army Medical Corps, procured for us a bottle of extract of ipecacuanha, and from it a Dutch volunteer medical orderly, Captain Von Bostel, made 150 doses of emetine (one grain in one millilitre of distilled water). This proved a godsend, and many Australians are home today as the result of the timely injection of the camp-extracted alkaloid. This is only one of the processes for which Von Bostel's skill and ingenuity were responsible. The almost instantaneous arrest of hæmorrhage and tenesmus in some of these cases was dramatic. A course of five injections was given, the disease was held in check, and the patient survived for later and more thorough therapy. Amoebic hepatitis and liver abscess were not marked in that camp. Cases came under our notice later at Nakompaton.

Pellagra.

The recognition of pellagra in Burma amongst prisoners of war was due to Major Sydney Kranz, Australian Army Medical Corps, early in 1943. The disease became more apparent as the year wore on, and by the time the 55 kilometre camp was in full swing there were hundreds

of typical cases among the prisoners of war, Australian and Dutch. The sore fissured tongue, angular stomatitis, anorexia, dysphagia, persistent watery diarrhoea (squitters), and the occasional typical rash became familiar to all medical officers on the line. Autopsy revealed shrunken heart, liver, spleen, kidneys, diaphanous bowel (rabbit gut) and a small thin-walled stomach. The brain in some was shrunken with convolution atrophy and secondary hydrocephalous; in these cases the patients had invariably shown mental symptoms before death. The inability to eat was an early feature. Many of these patients were scolded by their officers and others and told that they had lost their morale. Unfortunately the poor fellows had lost something more tangible than morale. It was my painful duty to urge men constantly to eat their rice; it was no use talking of non-existing vitamins. Too much of that talk had permeated the troops from Changi days, despite the fact that one realized there was something in the Dutch contention that patients who ate much rice became vitamin hungry, and this applies especially to beriberi, so little seen then. We continually urged men to eat everything they could get. If morale building was of any use, orderlies and staff did what they could in that direction. There was little else they could do, since the ration consisted of polished rice, cucumber, radish, and a flavour of meat, about one ounce per man per day. Nicotinic acid, even if available, would not have been effective; the changes were irreversible. It is doubtful whether known vitamin therapy would have been effective. Fat and protein malnutrition was the real deficiency disease.



Ward, Chungkai Base Hospital, 1943.

The Japanese would not allow us to buy food, even cattle seen by our own eyes outside the camp. Despite objections from some of my more cautious medical colleagues, I collaborated in a system of buying cattle by the more adventurous prisoners of war from the local villages and having them killed outside the camp at night. The sweet savour of meat was soon detected by our Japanese guards in local hut cooking pots, and the Japanese medical officer, who had by this time been sent to us, as a gesture of interest, winked his eye at the procedure. He was a sincere little fellow, unfortunately a small cog in a huge soulless machine. The response to this extra feeding on animal protein was apparent in a short time, and the thanks of many of us survivors of the 55 are due to the "Aussies", "Tommies" and Dutch who carried on their nocturnal operations. The money for this purpose was collected as a levy from officers' pay, and administered by Mr. Keith Bostock, an Australian Red Cross representative, a fellow prisoner of war. Organized talks by the medical staff and other officers, and the reception of good news from Kohn Kuhn underground radio helped a lot in the later days in that camp. The stories of the activities of radio fans and their hair-breadth escapes will probably be recorded elsewhere.

Nutritional Œdema.

Nutritional Œdema was often associated with pellagra. At first it was thought by medical officers to be beriberi. Attempts to relieve it by vitamin therapy when occasionally available failed. Major W. E. Fisher, Australian Army Medical Corps, early called attention to the fact that it was famine Œdema or protein deficiency. Remarkable response to meat diet *plus* fluid deprivation was seen in some cases. The milder forms of the disease were present with us right through our prisoner of war life. Many of us after our return to Australia showed some pitting of the leg. The word "beriberi" was often used in death certificates and in Japanese returns simply because it was one of the few terms they could appreciate. The use of the term as a cause of death or morbidity in patients from Burma and Siam must be treated with caution. Blood transfusion, to be described presently, might have helped some of these patients, but we had not then the equipment nor the technique which some of our colleagues on the Siam side had so brilliantly developed.

Ulcer of the Leg.

Ulcer of the leg was not the same in all patients. If the disease and the patient were in equilibrium, then there would be a circular ulcer 1.0 to 5.0 centimetres wide, with a slightly undermined edge, a sloughing base, bounded by, but never penetrating, the deep fascia. The site was often malleolar or on any part of the lower part of the leg,



Unloading sick from sampans at Chungkai, 1943.

sometimes behind the knee, on the thigh, abdomen, hand or face. An injury such as a bamboo or stone scratch was followed by the development of the ulcer. Ulcers were often intensely painful. Foments, curettage favoured by the Dutch, who had much experience in this disease, iodiform, if available, left on undisturbed for three or four days, together with rest, would alter the picture and suppuration would occur. If treatment was then repeated, rest prolonged, feeding adequate, and malaria controlled, the ulcer went on to healing in the usual manner. Such ulcers were typical tropical ulcers of which we had seen hundreds since early 1941. But a different picture was seen in a patient who, with such an ulcer, was driven to work (no rest), had frequent malaria, malnutrition and exhaustion. The edges spread, the base was not limited to fascia, the ulcer penetrated muscle, periosteum, tendon sheath and blood vessel, no pus formed, but only a black slough, with a thin watery discharge, scanty and foul-smelling. There were 500 ulcer cases at this camp. Two hundred were all of the latter severe variety. Gangrene was the universal disease in that group in lesser or greater degree. Excision of dead muscle and tendon led to a cure of some sixty patients. *Tendo Achilles*, peroneal, anterior and posterior tibial tendons were removed as indicated. Surprisingly little disability resulted later (a problem for discussion in a surgical paper). Joints, such as the ankle

and mid-tarsal joints, became eroded, pain was excruciating, there was no morphine, and the patient yearned to be relieved of his dead or dying member. For the first six weeks attempts were made by all available methods to save the limbs. Amputation had to be done, and I am sorry I did not undertake it sooner. Observation of the course of the disease and a correct appraisal of its part in causing the patient's breakdown were necessary. For example, a man with ulcers on both legs and amoebic dysentery was not a good risk. One hundred and twenty legs were removed, 25 below the knee. All patients survived operation. Half of them died in the next few months from pellagra, Œdema or dysentery. The remainder who returned home are amongst the most grateful patients. Some large ulcers which we watched for weeks, after the meat supply was supplemented, began to suppurate, and a sequestrum quietly formed. Later at Nakompaton the sequestrum, perhaps six to twelve inches long, was removed and healing occurred. The Japanese supplied a spray in the later stages and the smaller ulcers were thus treated with a solution of potassium permanganate. Most of the patients in these cases recovered, but the clandestine meat supply, in my opinion, was the principal curative measure. How we welcomed pus formation, the herald of healing. It was futile to sigh for various antiseptics and all the niceties of aseptic technique to prevent cross-infection. I shall not comment further on this tragic chapter of our prisoner of war life. A similar sad story could be told by any of the medical officers who were in jungle camps at that time. There are a number of reasons why the Dutch did not suffer so severely from ulcer of the leg. The return to pre-Listerian methods was forced upon us. Perhaps we were assisted by the application of the first principles of surgery. In any case the local manufacture of catgut from ox peritoneum, the distillation of alcohol, our main antiseptic, from rice, and the spinal use of cocaine as an anæsthetic helped to make surgery less barbaric than it might have been. Von Bostel, our technical expert, was indispensable in this manufacturing work.

Bamboo pylons were fitted to the limbless men, and crutches were made for them by recovered patients. Officer patients and volunteer orderlies contributed to ease the lot of these unfortunates. For my small band of nursing orderlies, the jungle section of the 2/4 Casualty Clearing Station, I have nothing but praise and gratitude. Before concluding this melancholy account, I shall quote a paragraph from a report which I sent to the Japanese authorities in 1944 describing conditions in this camp.

The spectacle of emaciated skeletons of men on the one hand, or the Œdematous water-logged wrecks on the other, many with rotting gangrenous ulcers of the leg, emitting a nauseating stench, lying in their pain and misery was such as I never wish to witness again. The daily procession to the graveyard of numbers of patients was a reminder to those still alive that the consolation of death would soon end their suffering. The memory of it is not easily obliterated.

A memorable event was the dedication of the cemetery. The Japanese Lieutenant-Colonel Nagatomo with all his pomp and dignity was spiritedly attacked in a speech by Lieutenant-Colonel Gottschall, prisoner of war commander, and publicly accused of neglect and mishandling of prisoners of war. At the end of December, 1943, we moved all the seriously sick to Siam, and here begins the second chapter.

PART II.

It might be fitting at this stage to point out that the Japanese subscribed, however slightly, to our humanitarian rules in that they placed doctors and sick together. Their idea of the function of a doctor was that of a medical policeman who miraculously cured his patient and fitted him for the heaviest of work. They supplied quinine in some areas, apparently in sufficient quantities. They took care by timely inoculation and vaccination to prevent the prisoners of war from becoming the centre of epidemic disease, such as plague, smallpox and cholera. They were not entirely successful in the two last-mentioned diseases. Their childlike faith in the supernatural power

of European medical men might be invoked as a reason for scanty supplies of drugs and medical equipment, but it could hardly explain the denial of adequate food supplies in a country where nature is so prolific. And the history of the Nakompton Hospital for the next eighteen months is largely the story of a fight, not entirely unsuccessful, with the Japanese for increased food and drug supplies.

On a flat piece of land, the site of rice fields, thirty-five miles from Bangkok, a new camp was constructed in January-February, 1944. The Japanese interpreter who showed me over the ground during construction said that some attempt would be made to keep within the Geneva rules. The function of the camp was to provide an asylum for 10,000 chronically sick and permanently disabled European prisoners of war from the Burma-Siam railway. The camp was to be called "The Nakompton Sanatorium". It consisted of 50 bamboo huts, each to contain 200 men, with wooden platforms for sleeping, no beds or bedding. A long wooden hut provided office accommodation, a clinic, a dispensary, a pathology laboratory, and an operating theatre. The last-mentioned had a concrete floor and fly-wire windows. Cookhouses had concrete floors and water troughs. Latrines between the huts were covered concrete pits. Such luxury we found rather overwhelming. There was no medical or surgical equipment provided by the



Chungkai, operating theatre.

Japanese; in fact the Japanese medical officer apologetically admitted that all he had to offer were the bare floors. However, incoming medical officers brought a few instruments and utensils and these were pooled. The ingenuity of patients and staff enabled us to be furnished before long with a makeshift surgical outfit and apparatus for pathological and biochemical work.

In 1944 the usual Japanese control through their dual administrative system, combatant and medical, obtained. The Japanese lieutenant-colonel commander of the camp had opposite numbers among the prisoners of war. Lieutenant-Colonel Sainter, M.C., was prisoner of war commander, I was chief medical officer, and Major Finch White was adjutant. As the British preponderated in numbers, they formed the bulk of the administrative staff, whose duties included discipline, cooking, hygiene, working parties and pay.

The uphill fight for better conditions in the early days of the camp was carried on by Lieutenant-Colonel Sainter and Major White in active collaboration with the medical staff. A number of British regular non-commissioned officers ably assisted in maintaining the camp discipline. The medical office staff was mixed, British and Australian. The close association of British and Australian prisoners of war was fortunate.

The Japanese medical officer was a certain lieutenant known to thousands as "Bloody Higuchi" as a result of his evil reputation in Burma. He, like some other Japanese

officers with an eye on the war *communiqués*, showed a belated change of attitude in 1944. The Chief Medical Officer acted under the Japanese medical officer's orders for the disposal of recovered patients, but independently with regard to the staffing, internal medical arrangements and treatment of patients. A General Purposes Medical Committee (Lieutenant-Colonel Malcolm (British), Lieutenant-Colonel Larsen (Dutch) and the Chief Medical Officer) together directed medical policy. A permanent Diet and Drugs Committee (Captain Cyril Vardy (British), Lieutenant-Colonel Larsen (Dutch) and Major W. E. Fisher (Australian)) advised the Chief Medical Officer in important medical matters. Captain Vardy acted as registrar and later, as adjutant, when, in January, 1945, all combatant officers, including dying patients, were hastily removed by the Japanese to a working camp.

The combination of Australian, British and Dutch medical talent was a success. Australian medical officers held the senior posts in medicine and surgery. Major Fisher was consulting physician (British and Australian). Lieutenant-Colonel Larsen held a watching brief for all Dutch patients and acted as consultant in medicine for them. Major Marsden (British) was the pathologist. British junior medical officers formed an excellent team of general practitioners in the wards. Captain Marcowicz (British) was the blood transfusion officer. Major S. Kranz (Australian) was officer commanding the operating theatre.

Early in 1944 essays by selected officers and men were called for by the Japanese, and a comprehensive *questionnaire* was circulated by them regarding the conditions on the railway. Some of the essays returned, presented a truthful account in no uncertain terms. At least one copy has been submitted without embellishment as evidence to the War Crimes Commission in Australia. The problem with which we were confronted was the rehabilitation of the first 7,000 chronically and seriously ill from the railway camps. The medical staff (prisoners of war) allotted by the Japanese was three medical officers and thirteen medical orderlies per 1,000 patients. Fortunately some sick medical officers arrived as patients, and they, on semi-recovery, were allotted duties. We never had more than a total of thirty doctors at work even at the peak periods. Requests were made at once for equipment and drugs, and food sufficient for the minimum needs of the patients. No equipment was forthcoming, but permission was obtained to build of wood what was urgently required for surgical work and physiotherapy. Food was issued on the following basis: Outside workers were given rice 600 grammes, meat 150 grammes, vegetables variable. Inside workers, including medical staff, were given rice 500 grammes and meat 100 grammes. Patients, rice 400 grammes, meat 50 grammes. This short ration of meat for the sick was a Japanese principle. A sick prisoner of war needed little or no food, and an encouragement to him to recover was the promise of better food when he resumed work. Thus the feeding in our hospital was officially on a low rate, as 7,000 out of the 8,000 were sick patients. Urgent requests were sent through the Japanese medical officer for increased rations, but with no result at that time. A canteen under a Japanese trader was provided, but our funds were short. Levies from officers' pay were all the money we could obtain. At that time officers were paid one dollar a day. (A dollar was 1s. 4d.) An illustration of the problem is shown in the following summary of minutes of the meeting of the Nakompton Medical Society, May 17, 1944:

A case of chronic dysentery was shown to illustrate the problem of how far it was reasonable to continue expenditure of money with little benefit. Capt. Vardy thought it wiser to spread expenditure over the general body of sick and not concentrate on such as this man. For months he had received an expensive diet (two eggs, and/or green peas a day), yet when an attempt was made to put him on a normal diet (rations) he relapsed. . . . Capt. Leigh emphasized the fact that the M.O.'s job was to keep such men alive so that if released soon they may be restored. Col. Larsen took the view that pellagra was a big element in the condition. Autopsies of such patients showed diaphanous bowel indicating poor power of absorption. He favoured the

policy of feeding them specially on green peas. Seemingly hopeless cases often surprised us by recovering. Col. Coates advocated a middle course. It was impossible on medical and humanitarian grounds to deny these patients extra food. Some will recover, and after all it is a hospital. At present the mass of men did not appear to be suffering unduly from deprivation arising from extras supplied to such patients, hence this system should continue. If the position as regards food became so bad that general suffering was acute, then a revision of policy would be indicated.

Two days later a supply of drugs (Red Cross) arrived. In June, 1944, the Diet and Drugs Committee recommended a monthly expenditure of 19,000 dollars on extra food for the sick (to be purchased from the canteen, eggs, peas and bananas). On July 2 a large consignment of Red Cross drugs arrived including emetine and sulphaguanidine. An operating outfit was reported by the Japanese doctor to have been lost, but I was forced to sign for it. There was enough emetine for a half-course for 250 of the total 1,346 registered amoebic dysentery patients. This windfall saved the situation for the moment. The careful selection of patients for the drug treatment was done by the Diet and Drugs Committee. The food situation did not improve very much. We could not possibly purchase enough for our sick out of the meagre funds available, and then we were informed by the Japanese that officers' pay was not to be used for that purpose. A demonstration to the Japanese medical officer of 564 patients suffering from scrotal dermatitis, indicating that this condition was well known to us as a prelude to an outbreak of pellagra, resulted in the issue of rice polishings, 25 grammes per man per day.



Cholera hospital, Hintok.

The problem was then attacked from another angle. The Japanese were asked to provide pay for light workers in the camp. This appealed to them. They would not feed or pay sick men, but they would pay for work. Thus was established a system whereby more and more men as they recovered a little engaged in light work, volunteer medical orderly, cigarette making, grass cutting, cleaning and sweeping, rat catching, fly catching, and finally bag making. The Japanese paid varying rates, ten to twenty cents a day for a half to a full day's light work, and thus patients who had recurring illness could engage a few days at a time in a little work and earn money. The fly catching business became popular, as ten cents were paid for 15,000 flies. Private enterprise was quick to seize the opportunity, and syndicates of patients built bigger and better fly traps with fouler and fouler bait, until finally it appeared that all the flies in East Asia were attracted to our camp. Seventy dollars a day was sometimes paid for flies. In order not to arouse Japanese suspicions I had to zone the fly catching business.

Later in the year 1944, 20,000 dollars were allotted for the sick by the Japanese. They stated that it was a

gift from the commander, but we learnt later that it came through the Red Cross at Bangkok. A small sum came over the fence from outside sources, but the men engaged in the contact work were caught and spirited away, so that avenue was closed. On one occasion a Korean guard from another camp brought a sum of money; the transaction was carried out in the dark, out of earshot of our own guards. Ducks and pigs were raised by prisoners of war, but only occasionally, at Christmas time, or when rations were short were they allowed to be killed.

An important medical controversy arose in October, 1944, when Captain Marcowicz read a paper on beriberi and the effort syndrome. The term beriberi had been loosely used hitherto, and many patients stated that they had cardiac beriberi. An investigation was ordered, and Major Fisher reported that most of the patients so labelled were not suffering from beriberi at all, but, if anything, suffered from effort syndrome. They were transferred to Fisher's care and he had most of them well after a few weeks. The term cardiac beriberi was expunged from the hospital vocabulary except for cases of *Sho Shin*.

Writing to the Japanese medical authorities in an official report on October 21, 1944, I made the following statement:

Our feelings of relief on arrival at a well-ordered camp with good canteen facilities can well be imagined. We observed a P.O.W. hospital being constructed and were full of hope that conditions would be vastly better than those we had previously experienced. To some extent this hope has been realized. Treatment by Japanese guards has improved, but violence is still too frequently used without apparent reason.

This camp has possibilities of becoming a really good hospital. I respectfully suggest that the improvements above outlined be implemented. [A long list of suggested improvements and equipment supplies was submitted.] As a hospital we expect some recognition of conventions regarding such institutions. We have the medical talent here and are confronted with problems which could be solved in many cases if appropriate equipment were available. Research of value to future generations of mankind could have been undertaken if such ordinary facilities were present. Medicine knows no racial or national limits. At present hydrochloric acid used medicinally and for soldering is obtained by passing a tube into the stomach of patients. We transfer blood from the less sick to the very sick, thus bringing all to a common low level. The HB value for the camp is 75 per cent. We need emetine, iron and insulin, morphia and disinfectant urgently.

On accommodation I wrote:

I personally have seen P.O.W. hospitals in France in 1914-1918 and in Australia in this war. Apart from the usual amenities such as running water, electric light, beds and bedding, all modern equipment is provided. The medical officers there insist on having all the requisite technical help. We cannot do so, and, like the Israelites in Egypt, we are forced to make bricks without straw. The spectacle of a badly wounded or sick man lying in his rags on the bare boards surrounded by dirt and squalor is as discouraging to the doctor as it is appalling to the patient . . . whether or not the I.J.A. subscribe to conventions so well known to Europeans (Geneva, Hague) I do not know, having been cut off from all communication with the outside world. I would point out to the local authorities that the spirit of the Geneva Convention could be observed in a wider sense than heretofore. Could we not have Red Cross markings, visits from international representatives, as is customary with European nations? Sick P.O.W. ask these questions. A gesture of goodwill and a merciful act which would go far to restore their faith in humanity would be the repatriation of the permanently sick and incapacitated, especially the tuberculous patients. . . . As last impressions are generally lasting impressions, I respectfully suggest that the I.J.A. implement these recommendations so that the remnant of sick P.O.W. returning to their own land after the war may carry with them happy memories and that they may with their association with the I.J.A. and the humane treatment they will have received be messengers of peace and goodwill, mutual understanding and respect among the peoples of the Pacific sea board.

The Japanese interpreter, a Ph.D. of Columbia University, remarked as he translated this report that Japan was a "have not" nation.

The blood transfusion clinic under Captain Marcowicz gave 1,500 transfusions at Nakompton. Cross typing was done, the blood was stirred for five minutes in a container, the fibrin being removed by the bamboo stirrer. The defibrinated blood was given by needle. This method was suggested first in the jungle by Major Reid, Royal Army Medical Corps, but it was developed in a big way at Chungki under Marcowicz. He employed a team of officers or orderlies (non-medical), who became expert at the work. A special report on this valuable contribution to the healing art in the jungle camps has been made by Marcowicz in the collected papers of the Nakompton Hospital. A noticeable feature was the small number of reactions. The physician and surgeon relied on the blood transfusion service for help in all sorts of cases. The anæmic malaria, the malnutrition, the debilitated dysentery and the poor surgical risk patients were steered along with the aid of defibrinated blood. We obtained two days' working pay for the donor from the Japanese. Among British and Australians there was never any trouble in obtaining donors.

The pathology department, under Major T. Marsden, Royal Army Medical Corps, performed a wonderful service with improvised equipment. Routine bacteriological and pathological examinations, section cutting, blood urea estimations, blood sedimentation estimations and gastric analyses were done. This is such an important section that I leave it to Major Marsden to give some detail about it in his contribution. This department put the *imprimatur* of a modern hospital on our primitive institution.

The medical department, with Major Fisher as consulting physician, was obviously the most important, and there were assembled examples of most medical diseases of the male sex—not only the tropical diseases, malaria, blackwater fever, dysentery, worms, leprosy, syphilis, yaws, skin diseases of all kinds, deficiency diseases, pellagra, œdema and beriberi, but also the usual well-known diseases such as peptic ulcer, diabetes, pulmonary tuberculosis, tumour of the brain, aortic aneurysm and so on. In fact, it was a medical examiner's paradise; even venereal warts of pre-war vintage were occasionally seen. The occurrence of sexual perversion was rare. The absence of stimulus, external and internal, physical and mental, was probably the reason. The diet was certainly not exciting.

At our weekly clinical meetings the following are a few of the cases shown and subjects discussed: surgery and chronic colon disease (Colonel Dunlop will speak of this in some detail), traumatic epilepsy, gumma of the palate, kyphosis (non-tuberculous) (we saw several of these clear up in three months), hysterical paralyses of the legs (common in Dutchmen), a liver abscess, secondary melanoma, a cerebellar tumour, syringomyelia, Wernicke's syndrome, wandering periostitis of the skull, mitral stenosis, hiccup cured by hypnosis, fractures, osteosarcoma of the *os coxae*, duodenal ulcer, beriberi, post-dysenteric neuritis, pellagra, tuberculous kidney, pulmonary tuberculosis (fifty cases reviewed by Captain Hewat), appendicitis in the dysentery patients, Crohn's disease, avitophthalmia (a dietetic experiment). Lively debate took place on differential diagnosis and a keen interest in the result of treatment and in the findings at operation or post-mortem examinations was displayed by the prisoner of war medical staff. We lived close to each other and to our patients. There were no murders and only two suicides among the whole 10,000 of us in the camp in eighteen months. The number of mental patients under restraint was never more than thirty. The team work of the medical staff was excellent. The zeal of the medical officer, himself oftentimes weakened and sick by under-nutrition, the splendid spirit of the medical orderlies and the volunteer staff were indeed refreshing, and reminded us that medical services are not saleable commodities in the commercial sense. Details of the activities of the medical department have been recorded in a paper by Major W. E. Fisher. The skin and dental departments worked full pressure. Valuable routine work was done by Major Clark, dental

officer, and by Captain Reginald Wright and Captain Kallermandelbal (skin). The scientists, Dr. Chapman and Dr. Kostermans, made alcohol, paper, stains, dyes, vinegar and a host of other commodities. Without them we could not have carried on.

Finally, a word about the surgical work. I wish to record my thanks for the collaboration and faithful work of a high order of surgical excellence to my colleagues, Lieutenant-Colonel Dunlop, Australian Army Medical Corps, Major S. Kranz, Australian Army Medical Corps, Captain J. Maconachie, Royal Army Medical Corps, Captain Winkel and Lieutenant Killian, Dutch Army Medical Corps. Details are out of place here. Aseptic surgery was not possible, but a judicious combination of antiseptics, with a maximum of asepsis, was aimed at. Naked hands were scrubbed in several changes of water, and then immersed in camp-made alcohol. Gowns were supplied by the Japanese and sterilized in a home-made autoclave. Caps and masks were worn. One orderly scrubbed up; therefore, at an operation there were never more than two or three people who could contaminate a wound. All instruments were boiled. Skin was cleaned up with alcohol. A typical operation was herniotomy, of which 114 were done by order of the Japanese, but only after we had thoroughly tested our antiseptic method. Clean cutting, no bruising or tearing of tissues, accurate anatomical identification of structures, the use of interrupted cotton sutures without tension and as few catgut ligatures as was compatible with absolute hæmostasis, and the swabbing of each layer with alcohol were the principles adopted. The modified Willys Andrews type of operation was done when the posterior wall of the canal was defective. The conversion of a vertical funnel into a transverse canal was the objective. Sound repair was obtained in all but three cases. Mild sepsis occurred in a few early cases only. Many of the patients were in the forties. The human material was not the best, and possibly we took more care because we missed the amenities of the modern hospital. All members of the surgical team operated in these cases. There was no mortality. Spinal anaesthesia, "Cutocaine" (Red Cross supply), was used (two millilitres of 4% solution) after July, 1944, for all operations below the nipple. There was no ether and very little chloroform. Pulmonary collapse occurred now and then. Post-operative malarial relapses often necessitated courses of quinine. Local anaesthesia was used for operations on the skull, on goitres and on most upper limb conditions. Improvisation of various kinds, such as home-made wire automatic retractors and suction pumps, was necessary, but except for bone and skull work our mixed kit of instruments was adequate. Horsley's wax was made from the tops of quinine bottles, silver clips were fashioned from beaten forks, and the soldering iron and the hot nail replaced the diathermy. The following is a list of operations performed.

OPERATIONS AT NAKOMPTON HOSPITAL.

Appendicectomy ..	140	Liver abscess ..	8
Herniotomy ..	114	Empyema ..	8
Enterostomy ..	25	Thoracoplasty ..	2
Rectal excision ..	2	Phrenic avulsion ..	1
Hæmorrhoidectomy ..	39	Lung abscess ..	1
Intestinal obstruction ..	7	Thyroidectomy ..	4
Enterectomy ..	7	Larynx ..	2
Nephrectomy ..	3	Glands ..	2
Nephrostomy ..	1	Major amputations ..	22
Bladder and prostate ..	10	Minor amputations ..	21
Testis and epididymis ..	14	Sequestrectomy ..	70
Hydrocele ..	14	Compound fractures ..	3
Craniotomy ..	5	Varicose veins ..	30
Laminectomy ..	3	Feet and joints ..	23
Peripheral nerves ..	5	Fistula, sinus and skin ..	100
Gastric ..	13	grafts ..	—
Cholecystectomy ..	10		
Spleen ..	3	Total ..	896
Pancreas ..	1		

Eighteen patients died.

Many abdominal operations were done of necessity, but we found that the naked hand technique was not to be recommended for exploring abdomens. Adhesion formation

no doubt due to mild infection from the sweating hand was too common. Renal calculi were common. There were 65 cases at the time of our release. In only two cases did we consider operation warranted—one was a case of left pyonephrosis, the other was a case of hematuria with much pain. Renal function test in the first case was done by the water excretion method. Later we had blood urea estimation facilities. A patient with tuberculosis of the kidney was also operated on. In these three cases there was a gross localized lesion, and, the total renal function being good, it was reasonable to assume there was another useful kidney. All three patients did well after nephrectomy. Our pleas for an X-ray machine fell on deaf ears as usual. Two large ruptured spleens were removed. In one case the spleen was in two pieces, and its pedicle could not be ligated. The ligation of the splenic artery through the lesser sac saved the patient's life.

It was realized by some of us early in 1944 that the rehabilitation of the sick prisoners of war not only was a matter of feeding and drug treatment, but that many men given adequate rest and encouraged to exercise quietly at the appropriate time would recover under their own steam. They might live in harmony with their parasites until they could be scoured. Thus came into being a department which played a big part in the recuperation of thousands of prisoners of war, that is, the physiotherapy unit and its attached workshop. Lieutenant-Colonel Dunlop,



Nakompaton alcohol distillery and vinegar plant.

the senior medical officer, surgical block, was an ideal officer to develop this unit, and by his knowledge and skill he introduced the right atmosphere into this section of the hospital. Artificial limbs for 170 men were made from odds and ends, and the thanks of the medical staff are especially due to Major Allan Woods and Major W. Wearne for their keen interest in this work. Colonel Dunlop will develop this theme further.

Pneumothorax treatment for pulmonary tuberculosis was done in appropriate cases by Captain Hewat. Tuberculous lungs did not do well, but fortunately were not numerous. There were fifty cases only diagnosed in the camp. Proctoscopy clinics were regularly conducted by the physicians in their own cases in the old-fashioned style.

Post-mortem findings were regularly reviewed at death meetings of the staff, the doctor in charge giving a clinical story and the pathologist giving his report. As chief medical officer I was pleased to note how few diagnostic mistakes or technical errors were made by the staff. The Japanese prohibited post-mortem examinations in March, 1945, probably because the local doctor was worried about the number of patients who died of residual deficiency disease. He forbade the use of the term "malnutrition" on death certificates.

In April, 1945, medical officers' pay was cut to twenty dollars per month because of alleged use of money by prisoners of war for the secret purchase of Chinese newspapers. Several hundred semi-recovered patients were sent away on long jungle marches. Some weeks later a residue returned suffering from severe malaria and the old enemy, nutritional oedema. Quinine supplies had been denied them. Melancholy could be read on the faces of our Japanese custodians. All kinds of petty restrictions were now imposed on us. Even the Japanese medical officer urged the Japanese camp commander to prohibit camp entertainments as in 1944. Our underground service was effective, and early in May we knew that there would be big events before the year closed. I ordered the expenditure of all funds on food by mid-September. As the month of August waxed, the security system of the Japanese was redoubled. Machine-gun nests facing ominously into the camp were regularly manned by the Japanese guard for practice. Korean informers secretly warned me of the Japanese instructions in the event of an attempt being made to release us by our own people. By August 13 they were the bearers of the exciting hush-hush reports. The fifteenth came and the good news (unofficial). Our own internal security measures were tightened. Colonel Dunlop and his police guard were at the ready. On the morning of the sixteenth I ordered a special evening meal for all ranks. While visiting the huts and having a word with the boys during the meal at 7 p.m., I was called to the Japanese commander for the official announcement of the armistice. Imagine the excitement, the cheers, the hand-shaking, weeping for joy, the flag hoisting, and the manning of the camp wall by our own police. Our own bugles sounded the calls. Next morning my senior officers and I visited the other half of the camp which during the previous two months had been filled with Japanese wounded from the Burma fighting. We offered our help to the woebegone Japanese derelicts of the jungle. The Japanese colonel in charge was much affected, but politely declined our aid.

We then had a general thanksgiving service.

Buried records were dug up. The complete war diary on which this paper is based and the I.1220's were collected. For careful notes on the latter Major Fisher is to be especially thanked.

For the war diary Captain Vardy is responsible.

I wish to thank Lieutenant-Colonel Malcolm, O.B.E., M.C., Lieutenant-Colonel Larsen and Captain Vardy for their help and advice on administrative matters during a difficult period. To the medical staff and their splendid work is due the mortality figure of under 3%.

Details of the perpetual struggle with the Japanese authorities—the battle of wits behind the bars—will be appropriately recorded in a paper to the Medico-Legal Society of Victoria.

After a short interregnum of two weeks we were taken over by the British R.A.P.W.I. Organization. Food and drugs were dropped from the air. A week later we had our first meeting with a white woman for over three and a half years in the person of Lady Louis Mountbatten. The seriously sick were taken to Bangkok and accommodated in the civil hospital awaiting transport home.

We medical officers were fortunate in that we had a job to do and never a dull moment during our term of imprisonment. Many is the time we blessed our heritage of 2,000 years of European culture and the background of sound training in the fundamentals of our profession. We learnt some clinical lessons.

Acknowledgements.

I wish to thank Colonel E. R. White, the commanding officer, 10th Australian General Hospital, and Colonel A. P. Derham, Acting Director of Medical Services, Eighth Division, for their example and inspiration in the ill-fated Malayan campaign, and Major-General Burston, Director-General of Medical Services, for the use of the war diaries which are now the property of the Australian Army Medical Corps.

CLINICAL LESSONS FROM PRISONER OF WAR HOSPITALS IN THE FAR EAST.¹

By E. E. DUNLOP, M.S., F.R.C.S.,
Lieutenant-Colonel, Australian Army Medical Corps.

I AM deeply sensible of the honour bestowed upon me by having been asked by Dr. Coates to join with my old prisoner of war colleague and friend, Major Marsden, R.A.M.C., in opening the discussion on the most fascinating and excellent paper he has read tonight. No doubt subsequent speakers from whom praise will come fittingly will express appreciation of his paper with the eloquence which is its due, but I desire to pay my personal tribute to the simply magnificent work carried out by my old chief under the appalling conditions you have heard described.

The profound and extraordinary results of this work were due not only to clinical genius, but to a mind stored with diverse knowledge, a spirit of unquenchable enthusiasm and fortitude, and a body as tough as an old oak tree.

His personal misfortune in becoming a prisoner of war proved the greatest good fortune for prisoners in the Far East, and an inestimable blessing for those concerned in the care of the sick. Dr. Coates has given an accurate survey of the general conditions of prisoner of war life in Burma and Siam, and all medical officers who shared with him experience of this unhappy episode will support him in the strongest condemnation of the detaining power.

Personal Experience.

As regards the background of my own experience, after capture in Java during March, 1942, the allied general hospital under my command was summarily and brutally dissolved, and all medical stores, other than small dispersed packages secretly carried, were ruthlessly confiscated.

Strongly voiced protests in terms of the Geneva Convention were contemptuously ignored, and most of the patients and staff were forcibly marched to a fantastically overcrowded native gaol where medical arrangements were negligible, rations deplorable, and no recognition was given to medical personnel. Red Cross brassards were confiscated, and under threats and compulsion all Red Cross markings were removed. As British Camp Commander, I narrowly escaped decapitation by an infuriated staff officer who lectured at length on "Bushido" or so-called Nippon chivalry. Active resistance to orders, however unreasonable, proved futile and disastrous, but every opportunity was taken to make representations, both verbally and in writing, to secure better conditions for prisoners.

During a period of some months as prisoner of war commander in various Java camps, I experienced great anxiety concerning the ominous signs of food deficiency diseases amongst prisoners. These were forecast to the Japanese, and their attention was repeatedly drawn to the deficiencies of the diet without result, so that it became necessary to make intensive efforts to purchase foodstuffs for ailing men with money from slender prisoner of war resources, and forbidden outside sources. Most of the early symptoms were those described in the classic descriptions of pellagra, notably angular stomatitis, glossitis, pigmentary changes and a dry scaly skin. Scrotal dermatitis became highly prevalent a few months after imprisonment, and together with the mouth changes was found rapidly to respond to yeast and other sources of the vitamin B complex. There was ample opportunity to prove later that riboflavin in doses of six to eight milligrammes daily brought about rapid improvement of this condition.

An arresting condition causing distress amongst at least one third of the troops was a severe burning of the feet, characteristically located mainly in the metatarsal region of the sole, and passing forward over the toes. Some patients presented similar symptoms in the hands. The phenomenon was particularly distressing at night, and caused great loss of rest. The patients presented feet

with good arterial pulsation and pink colour. Sweating was usually marked, and a clammy feeling common. The nails were ridged and brittle. Associated with the burning was hyperactivity of deep muscle reflexes, and in some cases knee and ankle clonus. In exceptional cases this condition progressed to a spastic diplegia. At this time dimness of vision became noted, in some cases alarming in degree. The centre of the visual field was most affected. Response was obtained to all these symptoms with a locally obtained black yeast, and to eggs, and katchangidjoe beans (a form of lentil esteemed by the Dutch). Burning feet, and particularly eye symptoms, were much slower in response.

Conditions in Siam Working Camps.

As a result of indiscriminate treatment of prisoners, I was sent via Singapore to Siam, as commander of a working force which subsequently bore my name. This party commenced railway construction work in the dense jungle bordering the Kwa Noi river. Major A. A. Moon, Australian Army Medical Corps, and Major E. L. Corlette, Australian Army Medical Corps, who accompanied this party, did splendid work in various parts of Siam.

The most wretched conditions prevailed during the railway construction period in 1943, and working camps presented a nightmare of slow starvation, illimitable overwork and disease. Men's clothing and boots rapidly wore out and were not replaced, and the protection against the deplorable monsoon weather consisted of grossly overcrowded slave hovels of bamboo, or very defective tents. Rations were largely inferior quality rice and dried vegetable, supplemented by a very small amount of dried fish. One of the important factors in sustaining life was a precarious intermittent supply by Siamese bargemen of ducks' eggs for purchase from meagre prisoner of war funds.

As the working force dwindled and wasted with disease and death, fanatical exhortations and savagery were used to exact greater sacrifice and devotion to the Imperial cause. Fixed numbers of men were compulsorily produced to work daily, and to meet these figures men staggered out with the support of sticks, or were carried on to the parade ground. When this savagery was opposed with the threat that all workmen would in desperation cease work, we were informed that this would mean no food and no water, and a fresh batch of sick were driven from a hospital that day, without these essentials.

Whilst for some months officially a camp commander, after performing in the jungle a successful night operation for a perforated duodenal ulcer by the light of a bonfire and two hurricane lamps, I was given some latitude to visit surrounding camps to perform emergency operations.



Healed tropical ulcer contracture.

¹ Read at a meeting of the Victorian Branch of the British Medical Association on February 6, 1946.

In order to maintain any control of medical arrangements, medical officers had almost to adopt the disastrous Nipponese standards of fitness, and in any case were often overruled by Japanese non-commissioned officers and privates after wearying argument. These taskmasters on occasion piled their sticks impartially on patients and doctors.

The limits of medical arrangements were set in this area by an ill-trained Japanese corporal, significantly known as "Doctor Death", who considered that the sickness rate was directly related to the hours spent performing percussion on the patients. Drug supplies were utterly negligible.

Towards the end of 1943 the number of men able to work was very small, and the so-called hospitals were packed with the broken debris of railway construction.

Hospital Conditions.

Before joining Lieutenant-Colonel Coates at Nakompton in the middle of 1944, I was successively in charge of Tarsau and Chungkai hospitals, dealing with the greater number of sick from approximately 25,000 men in this area. Lieutenant-Colonel W. G. Harvey, Royal Army Medical Corps, was for a long time senior medical officer of the Tarsau area, fighting most deplorable conditions.

With the scantiest support from the Japanese in medical stores, these hospitals were equipped, financed and run in the teeth of immense difficulties almost entirely from prisoner of war resources. These difficulties can well be



Ileostomy bottle (Dutch Army water bottle converted).

imagined in remote jungle areas devoid of even wire and nails, and with a starving population reduced to rags and pathetic oddments. The patients were themselves called upon to work upon their "beds" in mass production methods to produce all sorts of equipment ranging from ward utensils to artificial limbs and complex surgical instruments. Nevertheless, under these squalid conditions immense strides were made, and by early 1944 there was a most gratifyingly steep fall in previous appalling mortality, involving hundreds of death a month.

I am in sympathy with a soldier who, at this time, in answer to a propaganda *questionnaire* as to "the most kind action experienced by Japanese", wrote:

The most kind action I have met with by Japanese was shown by a soldier who before hitting me allowed me to take off my spectacles, and did not use a heavy stick.

After repeated appeals to "the honourable traditions of the Japanese army" I finally wrote:

It is respectfully submitted that whereas the Imperial Nipponese Army is disinterested in purely humanitarian conditions, the physical fitness of men employed upon work is a major factor in efficiency. Neglected and ill-fed beasts of burden, whether human or animal, cannot continue for long to function efficiently, and the work must suffer. It is therefore requested that steps be taken to improve the above-mentioned conditions which will otherwise soon reduce these men to a negligible working strength.

The medical problems of this period may be illustrated by three diseases encountered.

Cholera.

Numerous outbreaks of cholera occurred amongst prisoners in Burma and Siam, particularly during the humid monsoon season. The disease is a constant menace in these countries, and occurred amongst prisoners owing to the indiscriminate mixing of Asiatic coolies who contaminated water supplies, the denial of adequate sanitation arrangements, and frequently lack of facilities to sterilize water by boiling or chlorination.

In most cases cholera vaccine was available, but under the conditions was ineffective. Japanese behaviour in this matter was illogical and capricious, as in the case of an "H" force camp where they marched in several hundred unvaccinated men into the middle of an epidemic, and at about the same time endeavoured to detect malingers by ordering all suspects to pass their faeces on the parade ground.

The most severe outbreak I encountered was at Hintok camp, where Major Corlette and I dealt with an epidemic. In this one camp of approximately 1,000 men there were 150 cases, of which 63 were fatal. Though at the time no bacteriological help was available, the cases were severe and typical with dramatic prostration, copious vomiting, pouring diarrhoea with rice water stools, husky voice and cramps. A common early complaint was of a ringing noise in the ears, weakness and faintness, and in the most severe cases death occurred within a few hours of the onset of symptoms.

The Japanese were terrified of the disease, and were obviously anxious that the men affected would die quickly. In one case a soldier with cholera was shot by Japanese order.

In Hintok camp, sufferers were relegated to a deplorable morass in the jungle downstream from the camp, where they were housed under tattered defective tents. Men who were stricken with the disease when at work were not permitted to be carried in by workmen, but lay without attention until word was sent in to the minute hospital staff who then had to proceed some miles and carry the patients in over mountainous jungle tracks. The patients frequently arrived at night in pitch darkness and pouring rain, in almost moribund condition. The accommodation was such that the men could not be kept dry, bedding was utterly deficient, and they lay on rough bamboo covered by their soaked rags of clothing and bedding. With uncontrolled vomiting and purging, it was difficult to prevent the whole area from becoming an infected swamp. Furthermore, as at that time practically all camp inmates suffered from pellagra diarrhoea with six to eight motions daily, segregation of suspects and carriers presented almost insuperable difficulties, so that it was necessary to have a "suspect" isolation area for observation purposes.

Patients with the fully developed disease in the algid phase presented the pitiable spectacle of a shrivelled and pinched bundle of bones, some presenting little sign of life, others racked by vomiting and purging and tortured by abdominal colic and cramps. A characteristic in these very shocked and dehydrated cases was what we termed "cholera sleep", in which the patient lay completely inert with open lids and deviation of the eyeballs so the whites were exposed. Patients surviving the algid phase to the stage of reaction presented varying pictures. The typhoidal state, with a rosy flush and high fever, was an exceedingly fatal condition, and delirium and mental derangement invariably presaged death. Anuria was a most disastrous complication which was not affected by massive administration of fluids, and it was unfortunately not possible at the time to obtain any suitable alkaline solution for intravenous use.

A great number of deaths, however, occurred in a third phase of exhaustion and malnutrition, in some cases complicated by other diseases such as dysentery, malaria, pneumonia, tropical ulcer. Almost all patients developed severe protein oedema after the active cholera symptoms had subsided.

Treatment.

Preventive Treatment.—Stringent instructions were issued as regards food and water precautions and general hygiene measures, and where possible eating gear was dipped in boiling water before use. It was not, however,

possible under the terribly crude conditions to prevent fresh infections occurring.

Therapeutic.—In the alid phase heroic attempts were made to effect the life-saving measure of fluid replacement in grossly dehydrated cases. In one case a medical officer was reduced to making a cannula for intravenous use by drilling a bamboo thorn, and in some cases carefully collected rain water, or even river water, was simply boiled for intravenous use. Crude kitchen salt was used for saline manufacture. In my own camp I treated a few early patients by repeated massive intraperitoneal saline injections, using a Thomson Walker syringe attached to a large needle.

Three stills were rapidly improvised with condensers made by passing lengths of a stolen metal petrol pipe through bamboo jackets continuously irrigated with cold water delivered from a dam by bamboo piping. By working these stills night and day, one hundred and twenty pints of saline solution were produced in the twenty-four hours.

Eight crude continuous intravenous sets were manufactured from saki bottles, odd pieces of tubing, bamboo, wooden stoppers and assorted materials. Stethoscopes were early sacrificed to this need.

In severe cases up to twenty pints of saline solution were administered in twenty-four hours. To most severely dehydrated patients four to six pints were given fairly quickly, and after that an attempt was made to balance intake and output. Saline solution frequently had a magical effect, so that an inert bundle of bones might be restored to an animated patient who might request a cigarette.

Hypertonic saline solution was not employed in this area owing to the more exacting control required. It was employed as double strength saline solution by Captain J. Markovitch, Royal Army Medical Corps, at Chungkai, who reported favourably on the measure. Potassium permanganate was employed in the usual dosage, two grammes "pills" being made by wrapping crystals in a cigarette paper; but the measure was not very successful, and caused complaint of burning in the throat and gullet.

Atropine was not available, and though morphine in these circumstances would not have been withheld, only minute quantities were available.

The dead were disposed of by mass cremation on funeral pyres of bamboo.

In view of the severity of the infection and the wretchedness of conditions, the mortality rate of 42% in this series was pleasing, particularly as many of the deaths occurred some weeks after the infection.

The general mortality was well over 50%, and in one small limited epidemic amongst very sick men receiving special diets at Tarsau hospital, it was over 80%.

In the circumstances it was inevitable that some medical personnel caring for patients acquired the disease, and some gallant patients suffering from other diseases who gave voluntary help with cholera patients, also became infected.

Dysentery.

Dysentery was probably the greatest immediate cause of death amongst prisoners of war in Burma and Siam, and in areas in which I worked was responsible for between one-fourth and one-third of all deaths. It was, however, common for patients to suffer simultaneously from several diseases.

Bacillary Dysentery.

With coolie conditions of life, the more serious outbreaks of bacillary dysentery occurred during the first year. Later, under the same deplorable conditions of life, the bowel appeared to have become inured and more resistant to this type of infection. Frequently no drugs were available for treatment, and starvation diet and such palliatives as locally prepared charcoal constituted the treatment. When a little sulphaguanidine was still retained, this drug gave splendid results, and quite small doses of "M & B 693" also proved very effective.

Amoebic Dysentery.

Vastly the greatest numbers of chronic blood and mucus passers were ultimately proven to have amoebic infection, and in some camps this disease was appallingly prevalent.

In some cases both types of infection were undoubtedly present. At Chungkai hospital, of 11,347 admissions during 1943, with 1,237 deaths, the dysentery cases were as follows:

	Admissions.	Deaths.	Case Mortality.
Bacillary dysentery ..	718	129	17.5%
Amoebic dysentery ..	1,309	266	20.3%
Total dysentery ..	2,027	395	19.3%

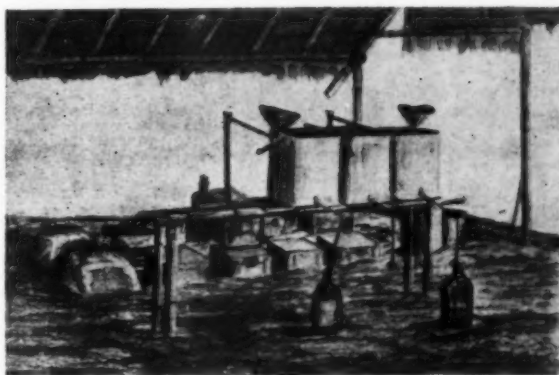
Patients shown to have *Entamoeba histolytica* infection presented some very great problems, of which the following were noteworthy:

1. Some cases were of appalling severity with most rapid deterioration and passage of blood and mucus as often as sixty times daily.

2. There was an acute shortage of specific amoebicide drugs. Emetine was not supplied by the Japanese, and was obtained only in small quantities by clandestine activities.

3. In some cases chronicity of the bowel infection became established and the patient became "emetine resistant". When this condition occurred, even large doses of emetine, such as repeated courses totalling more than fifty grains, were quite ineffective.

Pathology of Amoebic Dysentery.—In the acute manifestations of the amoebic dysentery with extremely frequent passage of blood and mucus, the lesions present in the bowel were frequently not of the usual limited and circum-



Distillery, Chungkai.

scribed type, but took on florid forms with cellulitic swelling and tumour formation. This was not infrequently associated with patches of gangrene spreading out to the peritoneal coat, and causing death from peritonitis by seepage of infection, or actual perforation. These florid lesions fell most heavily on the caecum and ascending colon, but spread to the ileum was negligible. In some cases hæmorrhage was severe, and foul sloughs were passed as large in diameter as a saucer.

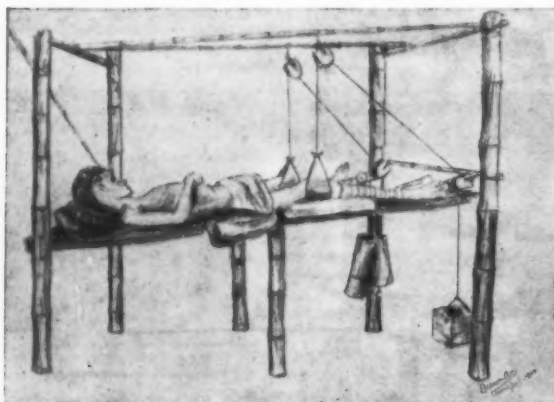
The Indications for Surgery.—Apart from surgical emergencies such as perforation of the bowel, the indication for surgical intervention was the failure of medical treatment under the particular conditions, so that the patient was deteriorating and appeared to have no other hope of recovery. In the last year of prisoner of war life at Nakompan some of these patients had received courses normally quite adequate for complete relief.

The cases fell into two main groups: (i) Earlier cases with acute symptoms in which great difficulty was encountered in finding some measure to combat the terrible deterioration occurring with constant passage of blood and mucus, severe pain, tenesmus and loss of rest. There was at this time a great shortage of amoebicide drugs. For these cases appendicostomy and caecostomy proved an effective measure and saved lives. Indeed in some cases the dramatic effects of operation exceeded all expectation. (ii) Cases of longer standing, even years, with gross colon damage, in which when specific amoebicide drugs had been given in

quantity, the patients failed to respond. In these cases the complete rest afforded by ileostomy proved a most valuable measure.

Appendicostomy and Caecostomy.—This type of operation followed by bowel lavage was introduced in Siam following observations made on the results of colon lavage by the rectum with various antiseptic and amebicide solutions. It was not found feasible to flush out the bowel thoroughly in this way, in all probability largely because the intense irritability did not permit the patient to retain large quantities without voiding. In order to gain more effective lavage, the measure of appendicostomy was introduced. Caecostomy was employed when the appendix was absent or other local pathological condition rendered appendicostomy impossible.

In performing an appendicostomy, it was not found necessary to preserve the appendicular artery and meso-appendix as stated by some authorities, and in fact this was frequently not possible. The healing was excellent so long as the small arterial branch at the base of the appendix was preserved. Following operation some patients required massive irrigations to obtain relief, as much as four pints being dripped through the bowel with the patient seated on a pan.



Illustrating jungle pattern Hamilton Russell extension.

It is considered that the relief of symptoms, which was in some cases surprisingly dramatic, was due to several factors: (a) Temporary rest of the bowel due to post-operative ileus, (b) the provision of a "bung" to allow easy escape of gas, (c) the more sustained effect of bowel lavage. In my personal series of twelve appendicostomies and two caecostomies no deaths occurred.

One patient failed to respond, and required an ileostomy, after which he made excellent progress. Another merely held his own, as against previous deterioration. The remainder regained good health, though cystic infection was not always eradicated.

Cases were, however, seen in which attack on the appendix or caecum, in the absence of emetine, was followed by disastrous amebic infection of the abdominal wall, and this type of operation gave much more certain results if combined with emetine treatment. It appeared to be best suited to cases in which the bowel damage was not very long standing and severe.

Ileostomy.—Lieutenant-Colonel Coates introduced ileostomy in Burma, and on his arrival in Siam aroused keen interest by showing the patient in excellent condition after this procedure. At no time before or after operation had he received any emetine.

The freedom of the ileum from infection rendered it a safe area for operation, and the complete diversion of the fecal current ensured complete rest of bowel. The only disadvantages were that a major second operation was necessary, and some patients, even when severely ill, were reluctant to undergo prolonged faecal soiling.

Technique of Ileostomy.—Large exploratory incisions were not used. The ileum was brought out through a small right iliac fossa incision either of the transverse variety, which gave easier exposure, or vertically through the right lower rectus, with a view to the "sphincteric" action of the muscle preventing the bowel prolapsing at a later date.

The site chosen was some eighteen inches from the ileo-caecal junction, to allow easy anastomosis at a later date. It was found best to divide the bowel cleanly, and to introduce two tubes, one in each limb. After approximately one week, when healing had occurred, the tubes were removed and an ileostomy bottle was applied.

The main complication of the operation was mild obstructive attacks with hiccups and vomiting, usually relieved by irrigating the proximal loop. The patients required careful attention as regards dehydration in the early stages, when more than 50 fluid ounces drained away daily.

Results of Ileostomy.—Out of fourteen such operations at Nakompton prisoner of war hospital, three deaths occurred, all in subjects amongst those first referred for operation whose pre-operative condition rendered the measure a forlorn hope. Most patients regained health, and some carried out a surprisingly active existence. Usually passage of blood and mucus ceased within a month, and some patients had no rectal motions for weeks at a time. All who survived the operation were markedly improved. In Lieutenant-Colonel Coates's original case the opening was closed two years after the original operation, by small bowel anastomosis. It was considered safer in most cases to leave closure until after relief as prisoners of war.

Lessons of Surgical Measures in Chronic Dysentery.—It is considered unlikely that under more normal conditions there will be many cases in which medical treatment fails. When such failure occurs, patients should not be allowed to reach a state of hopeless deterioration without consideration of surgical measures. The application of surgery to such catastrophes as bowel perforation and obstruction arising from dysenteric strictures requires no emphasis.

Tropical Ulcers.

A tropical ulcer scar is a most common mark of service amongst prisoners repatriated from Burma and Siam, and in some cases there is severe persistent disability due to large unsound scars, joint contractures, loss of bone and tendons, and chronic leg oedema.

During the latter part of 1943, practically all camps and hospitals in Burma and Siam contained hundreds of men suffering from this serious condition related to semi-starvation, gross over-work and exhaustion. Pellagra appeared to have a sinister influence in this disease, and disastrous exacerbations with spread of active infection not infrequently occurred with malaria relapses.

In a constant population of approximately 2,500 men at Tarsau hospital, there were about 700 casualties in the ulcer wards, and the figures were much the same at Chungkai. In the latter hospital, 1,352 men whose main diagnosis was tropical ulcer were admitted in 1943, out of a total of 11,347 admissions. The Dutch troops, who contained a high percentage of Eurasians, suffered much less from tropical ulcers than United Kingdom and Australian troops. For example, at Tarsau hospital in December, 1943, of the tropical ulcer patients in hospital Dutch, Australian and United Kingdom troops represented 3.8%, 13.5% and 16% of their respective populations in the Tarsau area.

Many Australians of the finest physique suffered from the most devastating ulcers, causing considerable loss of life and limb. Of 173 amputation patients at Nakompton, representing practically all survivors from amputation procedures, 89 were Australian.

For some months after commencing work in the jungle, men constantly exposed to trauma and blows frequently developed septic ulcers or "jungle sores" similar to the "veldt sore" or desert sore, which in the Middle East was associated commonly with streptococcal infection.

Later, in addition to this molecular type of ulceration with extensive cellulitis and lymphangitis, was seen the

much more disastrous tropical ulcer, which was in the form of a rapidly spreading foul gangrene with massive necrosis surrounded by a zone of inflammatory reaction. In the course of a week or a fortnight the ulcer might become the size of a saucer, or even a dinner plate, and devastating spread occurred through the fascial planes causing massive necrosis of bone and tendon. Secondary hæmorrhages occurred in certain cases from involvement of large arteries and spreading suppurative phlebitis, and thrombophlebitis of the deep veins was not uncommon. The ulcers characteristically occurred in the lower extremity, particularly the leg or foot, but the upper extremity was attacked, and almost all parts of the body, and even the face. Lesions of the hands were usually very severe, causing great disability.

Facilities for bacteriological work were rare, but the spirochæte and fusiform bacillus characteristic of the disease were identified in some typical cases.

I observed three patients who died an appalling death with multiple tropical ulcers arising in scattered septic lesions all over the body and limbs. The term "tropical phagedæna" was used in these cases. Toxæmia was most severe in all cases of severe tropical ulcers, as evidenced by rapid pulse, raised temperature, rapid loss of weight and great restlessness. The patients usually had a pinched appearance, with sunken but bright, pain-haunted eyes. By personal experience I know the pain to be severe, in the early stages a burning, throbbing sensation, with excruciating stabs on movement or contact, and later a continuous smarting irritation preventing rest. Spasm of the muscles occurs, and it was difficult to prevent patients with leg ulcers from sitting or lying with the knees drawn up under the chin; this resulted in a contraction with flexed hip and knee, and dropped foot.

In hospital areas many hundreds of these men lay massed in squalid huts full of the sickening stench of gangrene, and buzzing with flies which hung in clouds about the sufferers. Under these infected conditions, maggot infection brought pain and irritation without any benefit.

In the early stages of the hospitals I was concerned with, the absence of facilities for treatment and the complete paucity of trained orderlies which had resulted in pre-Listerian conditions of hospital gangrene, and in tropical infection spreading from patient to patient, infecting incised abscesses and open wounds. Waves of infection arose and spread from foci in the wards. There was an extreme shortage of dressings, instruments, antiseptics, splints and even hot water. Scraps of clothing boiled and reboiled, paper, leaves, and kapok and cotton gathered from local jungle sources, were employed as dressings.

The hospital patients and other available personnel were given tasks of mass production of improvised equipment, and every available source was combed for materials of all sorts.

Important materials produced for the treatment of tropical ulcers were large irrigating cans, small biscuit tins, and mud stoves (to burn locally manufactured charcoal, thus providing portable sterilizers for ward instruments), dressing forceps, and small wood and canvas splints to suspend the limb in a comfortable position, preventing contraction. Hundreds of dressings could be

done by a small team using a "non-touch" technique, and dropping the instruments in the sterilizer between dressings.

Intensive efforts were made to correct the nutritional deficiency in these patients by purchasing foodstuffs.

Methods of Treatment.

After extensive trial of such measures as hot fomentations, saline compresses, and such mild antiseptics as were available, it was apparent that these possessed little value apart from the toilet employed. Local sulphonamide application had no value in the active stages, even when available, but administration by mouth reduced toxæmia in some.

The application of strong cauterizing agents, such as pure phenol, lysol, chromic acid solution, "N.A.B." powder and saturated potassium permanganate solution, was much more effective, particularly if necrotic tissue was first scraped away. Iodoform even in dilute form was found to be the most valuable drug, and almost a specific. It was found that so long as iodoform could be obtained even in small quantities and combined with surgical methods, the ulcers could be brought into a clean healing state, and gangrene died out of the wards. I was fortunate in obtaining small quantities of the drug at fantastic prices from friendly Thai contacts, thus greatly reducing the number of amputations required. A saturated solution of potassium permanganate proved the next most effective application.

Surgical procedures were rendered vastly more difficult owing to the great shortage of anaesthetics, the crude conditions, and the paucity of operating materials.

The following measures were employed, all minor procedures being carried out without anaesthesia:

1. Curettage removing necrotic tissue.
2. Excision of the ulcer area and necrotic tissue, followed by application of phenol and iodoform. I have seen this measure produce a clean healing area with healthy granulation over a few days, and with prompt Reverdin skin grafting, complete healing could be secured inside a month.
3. Free incision to open up pus tracks, and the excision of necrosed tendons. As soon as the infection ate through the tendon sheaths, widespread necrosis and suppuration occurred and six to eight inches of tendon frequently were converted to a greyish yellow slough.
4. Skin grafting, which proved a measure of extreme value in promoting early healing with greatly reduced deformity, and in removing the danger of a recrudescence of activity. Reverdin grafts were usually employed, occasionally Thiersch or split skin methods. Reverdin grafts were successful in some far from clean wounds, so long as no necrotic tissue remained. In cases in which the ulcer bed was leathery and avascular, and healing completely at a standstill, even if the grafts themselves failed to take, they frequently produced some stimulation resulting in rapid healing from the edges. After some experience of sudden recurrence of active infection in healing graft areas, I found that a very light dust of iodoform over the graft area did not affect the take of grafts, and controlled tropical infection. Even with severe tendon loss, if rapid healing could be secured by skin grafting, there was little deformity and surprisingly good function. Great difficulties had to be overcome to improvise *tulle gras* and other materials, elastic pressure *et cetera* for skin grafting technique.
5. Sequestrectomy. Very large numbers of men presented big areas of necrotic bone exposed in the leg. Under the crude conditions of the jungle it frequently sufficed simply to extract the massive sequestrum without opening up tissue planes widely, but later at Nakompaton many patients were treated by formal exposure of the bone, and massive saucerization of cavities.

6. Amputations. Amputation of limbs was employed where the conditions were such that the infection could not be controlled, and life became endangered. The patients had to be watched carefully, as disastrous deterioration could occur in one or two days. A rising



Artificial leg, bamboo pylon.

pulse rate and sudden uncontrollable diarrhoea were grave signs, requiring prompt intervention.

Improved spinal anaesthesia was found most satisfactory. After extreme caution in the early cases, independent experience in various areas proved that while the local infection was of great severity, with careful exclusion and preparation of the operative field, the flaps could be brought together with a few sutures to secure primary healing, without grave danger such as would attend a similar procedure with infected gunshot wounds. The great difficulties with dressings rendered this measure advisable in most cases. The condition of the patients was so deplorable that prompt relief of pain and toxæmia and rest were necessary at all costs. It was frequently advisable, even with ulcers of the foot and lower part of the leg, to remove the leg above the knee, thus avoiding widespread infection in the fascial planes. Catgut was carefully conserved for the ligation of large vessels, until Lieutenant-Colonel Coates, at the 55 kilometre camp, Burma, introduced a locally produced article. Silk from parachute cord, cotton and other unabsorbable materials were widely used for many suture purposes.

The largest series of amputations (each over 100 cases) was done by Lieutenant-Colonel Coates in Burma, and Captain Markovitch, Royal Army Medical Corps, of Chungkai hospital, in 1943. Local conditions rendered the procedure a life-saving measure in these camps.

The average mortality in these cases was ultimately about 50%. This high mortality bore no relationship to the immediate surgical risk, which was under 10%, but a great number of the patients died weeks and months later waterlogged with nutritional oedema, even though the wounds had healed well. The severe form of tropical ulcer accompanied grave nutritional disorders, and the further loss of protein in copious discharges appeared to be a sinister factor. In a small number of cases sepsis occurred in serious form, sometimes accompanied by secondary hæmorrhage. In some, healing occurred with sinuses reflecting ring sequestra, and bone necrosis requiring later intervention. In only most isolated cases was there trouble with neuromata and painful stumps.

The ingenious artificial limbs devised from local materials not only helped in rapid restoration of function, but restored the individual's confidence in himself. As illustrative of the difficulties, leather was made from "cured" hides, thread was obtained from unravelled webbing equipment, and the iron was derived from officers' camp beds. Timber was "scrounged" from Japanese sources or obtained from jungle trees.

Major F. A. Woods, of the Second Australian Imperial Force, supervised this work at Nakompaton.

7. The treatment of contractures. The resulting contractures were frequently very gross and were rendered more difficult to treat owing to very adherent unsound scars which broke down when subjected to strain. Patient active and passive stretching of the joints was carried on over many months, assisted by such measures as massage, and stretching by sandbags or weight extension, and the employment of improvised physiotherapy apparatus.

Remedial exercises and physiotherapy methods were found to have a wide application in the rehabilitation of debilitated prisoners of war. This work was at first carried out in the open air, but at Nakompaton received sufficient recognition by the Japanese to be allotted a special hut.

Work of Non-Medical Personnel.

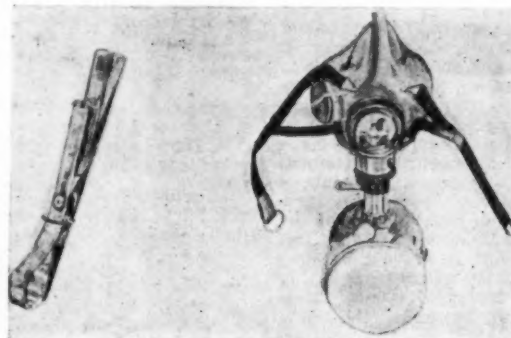
Whilst the devoted work and harmonious cooperation of medical personnel produced striking results, tribute must be paid to the immense assistance received from non-medical personnel. Not only did they make most generous contributions of money and possessions for care of the sick, but with the extreme shortage of medical orderlies, many became efficient nurses, or worked wholeheartedly in diverse hospital activities. This splendid support and cooperation with the medical services was a major factor in the survival of sick prisoners of war.

OBSERVATIONS BY A PATHOLOGIST DURING THREE AND A HALF YEARS AS A PRISONER OF WAR IN MALAYA AND THAILAND.¹

By A. T. H. MARSDEN, M.D.,
Melbourne.

THE causal association of famine, pestilence and death has been noted and accepted by mankind for thousands of years, and it is an undoubted fact that a gross deficiency of food is likely to be followed by a great increase of disease. It is surprising that very little scientific basis can be found for so well established an empirical fact, and not a little curious that so little of this assumed lowered resistance to disease can be shown experimentally in animals. The results of such experiments are generally confusing and frequently contradictory, but they may be summarized as follows. General deficiency of food probably produces some decrease in resistance, but whether trivial or substantial is uncertain. A gross deficiency of the vitamin A causes a marked increase in susceptibility to disease. Lack of vitamin C possibly also causes a lowering of resistance, but the evidence is very conflicting. With regard to the other food factors the evidence is so conflicting as to be valueless.

When we come to consider observations made on man himself, we leave this atmosphere of scientific doubt for the glad, confident morning in which the workers in the field of nutrition appear to dwell. Innumerable claims of a higher incidence of disease among various ill-nourished sections of a community have been made, and even now



Bowel clamp. Anaesthetic mask.

we are being warned that the serious malnutrition from which so many thousands in Europe are suffering may well lead to the outbreak of serious epidemics. I do not doubt that they are right, but if such an epidemic does break out, I wonder how far it will be due to malnutrition *per se*, and how much to such other factors as apathy, lack of proper sanitation, overcrowding, dirt and infestation with ectoparasites.

I, in company with many others, have recently had, as a major in the Royal Army Medical Corps, the opportunity of taking part in a large scale human experiment on the effects of prolonged malnutrition, conducted by those experts in malnutrition, the Imperial Japanese Army, and in addition we were able to observe from time to time the effect of such other factors as fatigue and intercurrent disease. It might be of interest to record the results which we observed and to see what was the effect of prolonged malnutrition on resistance to disease, how it was affected by fatigue and intercurrent disease, and to compare our results both with the experimental evidence and with the commonly accepted views.

Malnutrition.

Before we consider the effects of malnutrition, we must define the ways in which our diet was deficient. Of course, the ration was not constant and varied both in total

¹ Read at a meeting of the Victorian Branch of the British Medical Association on February 6, 1946.

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amount and in the amount of the various components from time to time and place to place, but however the ration might vary, it was always deficient in certain respects. The main deficiencies were as follows:

1. Fat. Fat was at all times grossly deficient.
2. Protein. The total amount of protein varied quite considerably, but was nearly always grossly inadequate. The deficiency was most marked in first class protein, the bulk of protein in the ration being of vegetable origin. The only camp for which I have any figures is Nakompaton, where the ration was very much better than it had been in the jungle camps. Here the ration usually contained 60 to 70 grammes of protein a day, but this figure includes bone and skin, and much of the protein was in the form of rather indigestible vegetables. When I estimated the actual protein excretion I found that the average amount of protein absorbed was only about 32 grammes. Theoretically, nitrogen balance can be maintained on about 18.75 grammes of first-class protein a day, and Chittenden states that 40 to 50 grammes of mixed protein are sufficient, but most authorities agree that this is too low for optimum nutrition and that the figure should be 100 grammes.

3. Vitamin B complex. Vitamin B₁ was deficient for the first two years, but after that I saw no more evidence of its deficiency. The B₂ complex (I include riboflavin and nicotinic acid and possibly other components) was deficient throughout the whole period. It was always a matter of surprise for me that I never saw any evidence of deficiency of the other vitamins, as the amount in the diet was usually below that recommended by most authorities.

Malnutrition may show itself in two ways, directly as a deficiency disease or indirectly by a lowered resistance to disease. The former may be classified as follows:

1. Effects of a general insufficiency of food. Loss of weight was, I think, universal; everyone I met was below his peace-time weight. Blood pressure was usually 15 to 20 millimetres below normal and the basal metabolic rate appeared to be lowered. In addition there was mental apathy with a general disinclination for any form of work or exertion.

2. Effects of a deficiency of fat. Here we are on more doubtful ground. It has been claimed that an increase in the incidence of tuberculosis will occur when fat is deficient in the diet. We certainly had a number of cases of tuberculosis, perhaps rather more than one would have expected, but not, I think, sufficient to prove anything. A form of dermatitis is claimed to be due to a deficiency of linoleic acid; such cases as we had we considered to be a part of pellagra and due to a deficiency of riboflavin; which view is correct I do not know.

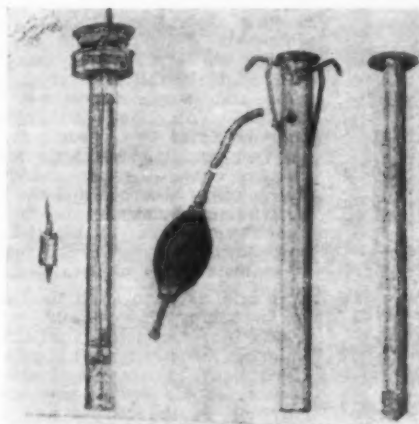
3. Effects of a deficiency of protein. Hypoproteinaemia occurred fairly frequently and I shall refer to it in more detail later. A more general effect which was noticed was a very slow convalescence from diseases which had involved much loss of weight. Rather surprisingly I did not hear complaints from our surgeons of delayed healing of wounds after operation which appears to have been well recognized elsewhere.

4. Effects of a deficiency of vitamin B complex. We had numerous cases of beriberi and pellagra to which I shall refer later. The cases of amblyopia were usually attributed to some factor in the vitamin B complex, but a deficiency of fat was also suggested; the aetiology is unknown and such suggestions are mere hypotheses awaiting proof.

A lowered resistance to disease may show itself in one or more of three ways, namely:

1. By an increased susceptibility to disease. Of this we had several good examples. First there was tropical ulcer which I firmly believe occurs only in a man on an inadequate diet; all our cases occurred when we were working up in the jungle and rations had to be transported a long way and were in consequence grossly inadequate. There were of course the other factors of fatigue, trauma and possibly some specific infection. Fatigue I believe does not predispose to a new infection so much as activate a latent one; trauma of course was common but by no means confined to the jungle. I very much doubt if there is any specific infection in cases of tropical ulcer; such an infection has never been proved, and while we

had wards full of cases of tropical ulcer I never heard of a single case of another patient or an orderly becoming infected in hospital. Undoubtedly some of the bamboos and possibly other plants gave poisonous scratches which healed slowly and were very liable to become septic. Such wounds may have allowed bacteria to obtain a firm foothold, but I still believe that an inadequate diet is an essential factor in the aetiology. It may be worth while to quote here the well known findings of Orr and Gilkes, and Orr, McLeod and Mackie, who found that of two tribes living together in Africa, the Kikuyu, living on cereals, roots and fruits, had a much higher incidence of tropical ulcer than the Masai who lived on milk, meat and blood. Another example was a marked liability to septic skin conditions; they were secondary to various conditions, but especially to eczema and scabies, and at times were extremely widespread. Perhaps yet another example of this increased susceptibility to infection was the invasion of the caecum and appendix by secondary organisms which occurred so often in our cases of amoebic dysentery.



Sigmoidoscope, Chungkai.

2. By an alteration in the clinical appearance of a disease. This assumes that many infective diseases usually occur in a partially immune person and that the normal clinical appearance is due to that partial immunity. The only examples of this were cases of chronic infection of prostate or bone which one would have expected to be due to the gonococcus or the tubercle bacillus, but which were in fact caused by low grade pyogenic organisms. Presumably such organisms have too low a virulence to cause infection in persons of normal immunity.

3. By slowness in overcoming infection. Perhaps the most striking example of this were the innumerable relapses from which our malaria patients suffered. It was by no means uncommon for patients to have 50 or 60 relapses, and I personally knew several who used to have a relapse regularly every fortnight.

It will be seen then that we suffered from both the direct and the indirect effects of malnutrition. If we except tropical ulcer which is only partly due to malnutrition, the morbidity and mortality from deficiency disease, especially avitaminosis, were far more important than any effect of the malnutrition in lowering the resistance to disease.

Now let us consider the influence of other factors on immunity.

Fatigue.

It has been shown experimentally on animals that fatigue will activate a latent infection rather than predispose to infection *ab initio*. This is exactly what I observed in our human experiment. Many of our men during the construction of the railway line were grossly over fatigued for long periods, but I never observed any increased susceptibility to disease. What I did observe

with distressing frequency was that a patient with malaria or dysentery who was apparently cured would relapse when he was sent out to work and became fatigued. A tropical ulcer which was practically healed would break down if the man was sent out to heavy work and the result of weeks of treatment would be undone in a few days.

Intercurrent Disease.

Dysentery, malaria and avitaminosis were very common diseases and frequently two or even all three would be present at the same time. Dysentery in its acute form killed many of our men, but most of our deaths from

dysentery were due to a combination of chronic dysentery with avitaminosis and gross malnutrition. Dysentery plus avitaminosis is very much more fatal than either alone and very much more resistant to treatment. From the very nature of the disease with the necessarily restricted diet, the hurried passage through the intestinal canal with lessened absorption, and the loss of protein in the blood and pus, hypoproteinæmia and avitaminosis must develop if suitable measures are not taken, and such measures were rarely available. An element of pellagrous diarrhoea added to a chronic dysentery was very fatal as the patients developed a vicious circle—the more diarrhoea the less vitamins absorbed and the greater the vitamin deficiency the more constant the diarrhoea. Such patients were very difficult to treat in the absence of injectable vitamin preparations.

Malaria, as is so often the case, was not a killing disease and very few deaths were directly attributable to malaria. Indirectly it undoubtedly killed many, exerting its effects by producing anæmia with consequent malnutrition of the tissues and also by lowering the resistance to other diseases. This effect of lowering immunity was clearly seen; if a patient with dysentery who was improving steadily developed a malarial relapse,

the dysentery also would relapse. Similarly a patient with tropical ulcer who developed a malarial relapse would also suffer a marked deterioration in the condition of his ulcer. Such an effect would be produced time after time with the establishment of a chronic infection and a steady deterioration in the patient's condition leading to eventual death.

Points of Clinical Interest.

Now I should like to mention some points of clinical interest which came to my notice.

Blood Transfusion.

Blood transfusion as we employed it has two points of interest, firstly our technique which involved the use of defibrinated blood, and secondly two of our indications for its use. Transfusion with defibrinated blood is very simple and we found it very satisfactory; the only possible objection to its use is the loss of the fibrinogen, but as this is only about 3% of the total protein it does not seem very formidable. The advantages are its simplicity and the absence of any citrate solution which is difficult to prepare "pyrogen-free". Originally it was forced on us by our lack of anticoagulants and we found that we had fewer non-specific reactions with this method than with the citrate method. I would certainly recommend it whenever there was any doubt about the purity of the citrate solution. Two of our principal indications for blood transfusions were anæmia and malnutrition. We found repeated blood transfusions extremely effective in the treatment of anæmia. In three weeks the hæmoglobin value in almost any case could be raised to 60% or more; if there was not such a response, some serious intercurrent disease

would be found complicating the anæmia. It was found that the transfusion did not act merely by adding erythrocytes to the circulation, but definitely stimulated the production of new erythrocytes, presumably by improving the nutrition of the bone-marrow. I will not say more about this because I believe that Major Fisher, who investigated this method of treatment thoroughly, will be publishing a paper on the subject. We also found blood transfusion a very valuable method of treatment of the malnutrition, and especially hypoproteinæmia, in cases of chronic dysentery and pellagrous diarrhoea; it was often the only method of treatment in such cases.

Hepatitis.

A curious outbreak of hepatitis occurred in the first six months of 1945. Major Krantz diagnosed the first cases and drew my attention to the outbreak; after that I saw a number of cases myself. The disease was characterized by low fever for two to three months, anorexia, tenderness over the liver, sometimes palpable enlargement of the liver and usually at some time jaundice which was often very slight. There were no fatal cases and I had only one opportunity—in the case of a patient who died from an unrelated surgical condition—to examine the liver histologically. Examination revealed quite marked periportal fibrosis with infiltration of the portal tracts by small round cells. I do not believe that it was an ordinary virus hepatitis because of the much longer course associated with a very mild jaundice. I consider that it was due to the low protein diet with low vitamin B content plus, probably, bacterial infection.

György and Goldblatt have shown that in rats a diet with a low protein content with a deficiency of the vitamin B complex (which part unknown) produces a liver necrosis with a periportal cirrhosis. And it is well established that the action of agencies damaging the liver is aggravated by bacterial infection; such infection seemed very probable in our cases because intestinal disease was so common. Further, an easy portal of entry for the bacteria might be provided by the lesions of the mucosa caused by *Strongyloides stercoralis* and *Giardia intestinalis*, both very common parasites among us.

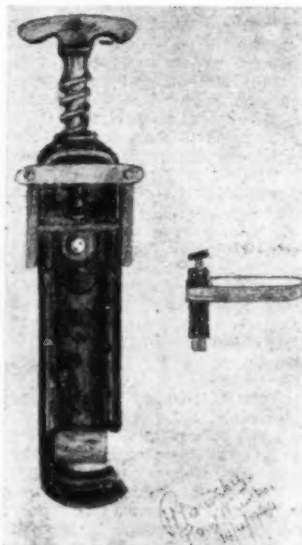
Amæbiasis.

A large part of my work consisted of the examination of the stools from cases of amæbic dysentery for the presence of *Entamæba histolytica* cysts. As a result of that experience I believe that I can make certain statements of importance in the diagnosis of chronic amæbiasis. The figures quoted are from a paper on the detection of *Entamæba histolytica* cysts in faeces by H. Fairfield Smith and myself which is being published separately.

1. The detection of the cysts of *Entamæba histolytica* in a stool depends on the number of cysts passed and on the frequency with which they are excreted.
2. There is no way of detecting all chronic amæbic infections by stool examination, and the detections of any but a small minority of those in which 10,000 cysts are passed daily is impracticable.
3. Observations on successive days are correlated so that an examination on only two or three successive days



Nasal snare.



Rib shear and side screw.

is not representative of the true position; it must be remembered that the excretion of cysts is usually intermittent.

4. In my experience of about 1,100 patients six consecutive stool examinations resulted in the detection of one or more *Entamoeba histolytica* cysts in probably about half the cases in which actual infection was present. Again quoting my own figures, one examination probably detected about 20% of the cases, two examinations detected about 30%, and three consecutive examinations about 37%.

5. To obtain an even chance of observing at least one cyst it would be necessary to examine: from a patient passing 1,000 cysts a day, about 220 stools; from a patient passing 10,000 cysts a day, about 22 stools; from a patient passing 100,000 cysts a day, about 2 stools; while from a patient passing 1,000,000 cysts a day, the examination of two stools will give almost certain detection.

It follows from what I have just said that the examination of one or more stools for the presence of *Entamoeba histolytica* cysts is by no means an infallible method of diagnosing chronic amebic infections. The importance of sigmoidoscopic examination in all cases of suspected chronic amebiasis and in known cases after treatment is emphasized. Not only can many cases be diagnosed confidently from the appearance of the ulcers in the bowel, but a swab taken from a doubtful ulcer will almost certainly reveal *Entamoeba histolytica* if it is present.

MEDICAL ASPECTS OF THE SINGAPORE CAPTIVITY.¹

By COTTER HARVEY,
Sydney.

To give anything like a complete story of the Singapore captivity from a medical angle is obviously impossible in the space of twenty minutes. I can but note a few facets, attempting to lift here and there the veil of silence which all but enveloped us for three and a half years.

The rapidity with which Singapore fell resulted in the captured force finding itself with a surprisingly large number of skilled medical personnel. In the Australian Imperial Force at strength of 15,000, there were 87 medical officers; the number was later, however, to be considerably increased. Also, as Singapore was an important base, a considerable quantity of drugs, instruments and to a less degree hospital equipment was accumulated, only a proportion of which fell into Japanese hands. These two facts modified the conditions under which the wounded and later the sick were able to be treated on Singapore Island, and enable a picture to be presented which would not have been a sombre one were it not for the ever-present problem of food deficiency. Ever and anon, however, there intruded into our rather monotonous camp life distressing features, grim reminders of the callousness and cruelty of which our captors were capable. These included the bringing to us of prisoners in a state of shocking neglect and malnutrition from the notorious Kempe prison, the return of working parties in sorry plight from the infamous Thailand-Burma railway, and the reception of sick from isolated camps, especially Dutch from nearby islands, whereon medical facilities were lacking and Japanese brutality seemed to flourish.

For the early picture (Table I), let me quote you the words of Brigadier Stringer, Deputy Director of Medical Services, Malaya Command, in a memorandum on "the first 100 days":

During the last week of hostilities amidst the chaos of island invasion, hospitals were one by one evacuated out of the front-line areas to a small area along the waterfront, and there under incredible conditions of improvisation, shelling and bombing, had to carry on with their care of the sick and wounded.

After the surrender British and Australian troops were herded to Changi and arrangements had to be made there for hospitalization up till such time as the main units, still working under great pressure in

Singapore, could evacuate their patients, their equipment and their personnel.

In Changi two large hospitals, British and Australian, were opened up, but under Japanese orders all units were established by 10th March, 1942, in a small area of seven barrack blocks, and became Roberts Hospital with 2,500 patients.

The conditions were appalling; gross overcrowding, no running water, no lighting, no proper sterilization, shortage of drugs and medical equipment, and no existing arrangements for the disposal of human and hospital waste products. From these heartbreaking beginnings great strides have been made, and although perfection has not been and never can be reached under existing conditions, the hospital staff can look back with pride on the results of their labours.

The morale of all troops was low in those days, as was only to be expected. But the members of the medical corps were fortunate, above all others, in that they had a constant job of work. Here I should like to pay tribute to Colonel Douglas Pigdon, later to die of cerebral tumour in Manchuria, who as first Officer Commanding

TABLE I.
First Hundred Days: Hospital Admissions.

Admissions and Deaths.	British.	Australian Imperial Force.	Total.
Total admissions	11,963	4,080	16,043
Percentage of strength ..	33.2	27.2	31.5
Dysentery admissions	6,512	2,019	8,531
Percentage of strength ..	18.1	13.5	16.7
Beriberi admissions	477	104	581
Deaths:			
Total	185	38	223
Pure dysentery	84	13	97
Associated with dysentery ..	10	3	13
Associated with beriberi ..	48	3	51
Battle casualties	43	10	53

the Australian Wing of the Combined General Hospital, insisted on the maintenance of a high standard of nursing and bade his medical officers give continued instruction to all ward orderlies. Thereby a nursing cadre was built up which was to give good service in many places and countries in the troublous times ahead.

The outstanding medical and nursing problem at first was the dysentery epidemic. Admissions rose steadily, until it seemed (as one medical officer remarked) that the hospital would be engulfed in a flood of faeces. A major of the Indian Medical Service from whom we sought information regarding the behaviour and control of dysentery epidemics assured us gloomily that we could not expect any improvement for months. Fortunately, this prophecy was completely falsified, as the figures show (Table II).

TABLE II.
Dysentery: Hospital Tally (1942).

Date.	Number of Patients (Australian).
March 3	287
March 13	391
March 22	469
March 29	300
April 2	235
April 5	169
April 10	124
April 25	British, 800 Australian, 120
May 5	British, 846 Australian, 113
September 27	British, 793 Australian, Imperial Force, 94

¹ Read at a meeting of the New South Wales Branch of the British Medical Association on March 15, 1946.

This result must not be regarded as a medical success, but rather as an example of what can be achieved by complete cooperation among all units in camp hygiene. Officers and men, both medical and combatant, worked with enthusiasm, and were inspiringly led by our Divisional Commander, Major-General Callaghan, who became notorious for the zeal with which he "snooped" around cookhouses, latrines, quartermasters' stores and the like, covering many miles a day in the process.

We gave treatment on standard pre-war lines with magnesium sulphate *et cetera*, and we had deaths, which later would not have occurred. But it was not until September, 1942, that supplies of sulphaguanidine reached us. They did not last long, unfortunately; but noting the high dosage in the administration of that drug we were emboldened to try sulphapyridine in similar amounts, and thenceforward acute bacillary dysentery ceased to be a camp problem. Most patients receiving "M & B" therapy became constipated in twenty-four hours.

The rise of the deficiency diseases, however, eclipsed all other medical problems (Table III). As soon as the Imperial Japanese Army issued its diet scale to us, we were warned by a Malayan dietetic authority that beriberi

TABLE III.
Deficiency Diseases (Many Combinations).

Disease.	Time of Appearance.
Beriberi	April 14.
Encephalopathies	April
Serotal dermatitis	May.
Stomatitis	May.
Glossitis	May.
Painful feet	June.
Corneal degenerations	June.
Retrolbulbar neuritis	July.
Pellagra	August.

was inevitable within six to eight weeks, and this duly came to pass despite all efforts to prevent it. The first cases appeared early in April, among British troops who had been for years in the tropics and were heavy drinkers; hence the type was mainly neuritic. We "played up" beriberi hard, to impress our captors with the need for increasing and balancing our diet, and we notified all cases to them. Therefore, anyone with oedema of the feet was diagnosed as suffering from beriberi, while several cases in which death occurred suddenly (and admittedly, rather mysteriously) were dubbed "cardiac beriberi". (In retrospect, it must be admitted that we over-diagnosed this disease, a fact that had important repercussions later, when troops returned from Thailand, many carrying the label of cardiac beriberi. These men had to be kindly but firmly detached from their diagnosis, lest they became cardiac neurotics). However that may be, we gained our point. Sceptical Japanese medical officers visited the

hospital on April 24, saw our patients and were convinced. They sent us several million vitamin B₁ tablets—presumably dried yeast—and some injectable vitamin B₁, and did make efforts to procure rice polishings. Meanwhile, we used "Marmite" sparingly but with much more success than the Japanese tablets and made our own yeast, special yeast centres being set up for this purpose, and we also made tremendous efforts to balance our diet. Table IV provides an analysis of our diet.

For the other deficiency diseases that followed we were not prepared; in fact they puzzled us a lot, until we came upon an article in a Malayan medical journal, giving an accurate description of nearly all of them as having occurred among Malayan gaol inmates. This, no doubt, dashed the hopes of potential thesis-writers; but it aided us in assessing the problem, particularly in recognizing the importance of green leaves and grasses as a source of riboflavin. After preliminary experiments by chemists the camp went in for grass and green leaf extraction in a big way, and with the aid of electric power, which was now available, much ingenuity was shown in the invention of machinery for the purpose. There were fortunately some high-ranking scientists among the prisoners of war, and they had plenty of fun and games, with willing assistance, in getting the plants together. I was fortunate in picking up the "Number 1" man of May and Baker in the Far East, and with the aid of lawn mowers, motor car pistons and a good deal of engineering help, he was soon turning out some 50 gallons of grass extract a day, with an estimated riboflavin content of about five milligrammes per pint. It was not unpalatable, and though it would be too much to say that grass soup was a popular item on the menu, the men drank it. Pasture grass was not over-plentiful, and the coarse native grass, *alang*, was considered of no use, so green leaves, especially of the wild passionfruit, were used when obtainable. As I mow my lawn these days, I think sadly how much riboflavin is going to waste.

All ranks made great endeavours to grow their own vegetables, the Imperial Japanese Army cooperating by supplying seed. We alternated between praying for good crops and hoping for release before the harvest. Alas, we were to plant many more gardens before that happy event.

We made an early start with post-graduate work; ward rounds and lectures were carried on for many months until they were prevented by circumstances, while an august body called the Changi Medical Society held monthly meetings for over two years, at which many important topical and other papers were read, and which commanded an audience that often topped the century. If this body ever publishes its archives, they will make interesting reading, as the standard was high.

The camps in general went in for an ambitious educational scheme: Changi University appeared on the map. This, together with the various theatres that rose almost mushroom-like—there must have been eight of them

TABLE IV.
Daily Diet Analysis.¹

Year.	Carbohydrate.	Protein.	Fat.	Calories.	Thiamin : Non-Fat Calories.	Riboflavin.	Nicotinic Acid.
1942:							
March	481	49	21	2,120	0.196	0.77	6.0
October	536	86	51	3,030	0.48	2.1	21.3
1943:							
February	490	43	47	2,430	0.39	1.3	7.4
August	548	86	49	3,054	0.53	2.6	17.5
1944:							
Average	480	55	50	2,600	0.28	1.9	7.2
1945:							
March:							
Workers	203	32	45	1,746	0.32	0.76	3.8
Non-workers	244	27	44	1,486	0.38	0.70	3.1
July:							
Workers	261	26	52	1,623	0.36	0.68	3.2
Non-workers	227	25	51	1,482	0.39	0.65	2.8

¹ The figures for nicotinic acid and riboflavin are in milligrammes; those for carbohydrate, protein and fat are in grammes.

in the camp's heyday, all putting on rattling good shows—gave a great fillip to morale. Pride of place as morale builder must go, of course, to the daily news bulletin, to obtain which men literally took their lives in their hands. The "canary", as it was euphemistically called, practically never failed us in the whole three and a half years. The men who collected the news deserve full marks for cool courage and devotion to duty.

I must now skip over such items as the diphtheria outbreak with its unusual skin manifestations; the rise of tuberculosis among the British—30 cases in the first six months, while our first case did not appear until we had been twelve months in captivity, thanks, of course, to the preliminary fluorophotography; the institution of the "fattening pen", a special diet kitchen and ward which saved many lives; the remarkable recovery of some of the battle casualties, especially those with chest wounds; the dengue epidemic with wonderful rashes; the comparative absence of malaria: all these will be fully recorded in due course.

The hospital moved in August, 1943, from Changi to Selarang barracks, some one and a half miles away. Of its nine months' sojourn there I have no time to tell. The main event was the return of the up-country parties, and of them Major Fagan will tell you a little.

In May, 1944, the hospital made a bigger move of some 25 miles, right across the island, to Kranji by the Johore Causeway, while the remainder of the troops went into Changi gaol. There 1,200 patients were accommodated in *atap* (palm leaf) huts, and in the sylvan surroundings of an old rubber plantation we eked out a more primitive existence for the remaining fifteen months of our internment. The idea was to send the sick at regular intervals to Kranji, and to keep Changi as a working camp; but this eventually broke down, mainly from lack of transport, and Changi at the finish carried more sick, thanks to its population of some 12,000, than Kranji.

I think I can best give you the medical picture there by citing extracts from my reports, the first, covering the first six months, to the end of November, 1944:

"General health of all, both patients and personnel, has been very good, considering. Rations have shown a gradual diminution in caloric content, but an improvement in the Thiamin/Non-fat Calorie ratio, due in the main to a reduction in rice and an increase in green vegetables. We now exist on a lower, but better balanced diet. This has resulted in a general moderate loss of weight and in a reduction of deficiency diseases.

"Beriberi is steadily declining, though its numbers are augmented by the regular drafts from Changi. Some of our long-standing patients, however, notably the 'down country diarrheas', rest on a knife-edge and tend to show oedema from time to time. We have several severe neuritics, and two cases developed acute cardiac beriberi (one, a member of our A.A.M.C. staff). Both these recovered after "Berin" parenterally and other appropriate treatment. In some of the deaths that have occurred among F. force personnel here, cardiac beriberi was probably a factor, in one possibly the cause of death.

"Rice polishings have been available in inadequate quantities, but they have helped in treatment. In addition, a small amount of extra towgaw and soya bean has been given to a few selected patients. Of great value, too, has been a regular supply of eggs from A.I.F. Changi officers for the past six weeks. These, at the rate of from 15 to 30 per day, have been distributed among those most in need of them. In view of our low protein intake, the help these have afforded us has been material, and I should like to express my appreciation to all those officers and others who have generously contributed.

"Increasing green vegetables have diminished the riboflavin deficiencies. In addition, extra leaves for some, especially 'eye' patients, have been made available.

"Malaria: There has been a satisfactory reduction in the number of 'primary' cases (from 79 in August to 10 in November) due to excellent work by the anti-malarial control group, who are permitted to make excursions twice weekly for oiling, draining, etc. in the vicinity of the camp. Lack of oil may impede their efforts in the near future.

"Dysentery: There has been an occasional case of bacillary type, but nothing in the nature of an epidemic.

Acute diarrhoea here almost always responds immediately to a short course (ten grammes) of sulphaguanidine. Amoebic dysenteries tend to relapse, but most are controlled by a short course of emetine (gr. 4) of which supplies are nearly exhausted; some cases are now emetine-resistant, but relief may follow a course of acriflavine enemata. There are a number whose chronic diarrhoea persists, mostly associated with some form of parasitic infestation of the bowel, who have nevertheless improved in health and morale by light gardening work or mild physical culture. Cases of respiratory disease have not done well at Kranji and a number of asthmatics have been returned to Changi. Two cases developed lung abscess, secondary to bronchiectasis; both recovered with postural drainage. There are five cases of pulmonary tuberculosis, of whom two are now having artificial pneumothorax therapy. At the moment, all are improving, but the outlook for at least two is precarious.

"The mental ward has been kept busy, with a steady deterioration in the condition of most of the patients, and an average number of patients greater than at any previous time. Skin conditions have been satisfactory, considering the difficulty in obtaining medicaments.

"The greatest economy has been practised in the use of all drugs, resulting in inadequate treatment for all diseases, and perforce, no treatment for some. Despite this, the death rate has been low (18 deaths in 6 months) though undoubtedly some lives could have been saved had adequate therapeutic resources been available. Food lack, of courses, has been more serious, but this cannot be elaborated upon in this report."

The second report written at the end of May, 1945, covers the next half year:

"The past three months have seen a change in the type of hospital practice, consequent on the admission of patients direct from some working parties and the cessation of transfers from Changi.

"Thus there have come to us some severe cases of beriberi, of all types, of malaria and a number of cases of amoebic dysentery. In the main, these patients have been Dutch, especially civilians from Pulau Damer. On the other hand, our tuberculous patients with one exception (an empyema) have been returned to Changi.

"The number of patients has been reduced but so has that of the staff who are now busier than they were six months ago. This reduction was occasioned by the setting aside of a portion of the hospital to accommodate a working party. As a result, a number of our chronic patients were transferred to Changi hospital.

"In March, a drastic cut in the rice ration reduced our daily Calorie intake to a level which appeared alarming; e.g., in January workers had 2,726 Calories daily, and patients 2,650, in March this was reduced to 1,746 for workers and 1,486 for non-workers (thanks to slight increase in rice and to Red Cross food these figures rose in May to 1,971 and 1,797 respectively). This resulted in a great acceleration of weight loss, some wards averaging seven pounds per man in the first month. Scales have not been obtainable for patients for the past two months, but it is evident that this rate of weight loss has not been maintained. The food deprivation has been felt most keenly by the dysentery patients, in several of whom it was sufficient to swing the scale against them, whereby their lives were forfeited. It was foreseen that this might happen and appeal was made for extra sustenance for them, without result. The staff have also lost considerable weight, but in general have carried on remarkably well. There is a steadily increasing number, however, who are unfit for any sustained work, and some are totally unfit.

"The coming of the Red Cross food supplies has given a general psychological stimulus though amounts have been insufficient to have any real effects. By setting aside nearly all the milk, however, selected patients have been given 1 to 2 pints daily, a valuable supplement; a few have also had some extra protein (beef) from the reserve rations.

"Red palm oil has been issued, both from the general camp amenities fund and the special A.I.F. fund administered by Lt. Col. Webster, as many as 50 A.I.F. patients being supplied thus with 1 oz. daily. This latter fund has

also provided beans, tapioca, flour, sugar and other food-stuffs and has been a great source of assistance to the sick. The eggs sent from Changi have been invaluable of course, and it is regrettable that the supply has become irregular and uncertain during the past two months; it is hoped it will not cease.

"Our quota of Red Cross drugs, which reached us early in May, contained adequate supplies of all vitamin preparations for at least three months, despite the exhaustion almost simultaneously of the rice polishings supply. It also gave us a reasonable replenishment of all sulphonamides, of barbiturates, aspirin and some ointments, but an inadequate quantity of anti-mæbic drugs and of the alkaline 'anti peptic ulcer' salts. Nevertheless, the arrival of this supply has considerably eased the dispensing situation.

"Beriberi is in abeyance in the camp, except for recent admissions, and other 'B' deficiencies are few and mild in type. There is, however, an increase in skin sepsis and ulceration, probably with a deficiency basis. Several patients have sustained a superadded diphtheritic infection and one of these has now a severe polyneuritis.

"Malaria is on the increase, as might be expected, since work by our outside anti malarial party has been forbidden by the I.J.A. for the past 3½ months.

"One case of blackwater fever occurred in a patient who has been constantly in hospital or convalescent depot; he has recovered. It is noteworthy that subtertian malaria is becoming much more common.

"There have been sporadic cases of bacillary dysentery, all of whom have responded rapidly to treatment by sulphaguanidine or sulphapyridine.

"There is evidence of increasing worm and other parasitic bowel infestation; response to treatment is capricious and it seems evident that only adequate diet can clear up all these conditions.

"It is worthy of note that the morale of the camp has remained consistently high, a factor of great importance among the chronically ill, especially the dysenterics. Many factors have contributed to this satisfactory state, but the entertainments afforded by the camp theatre and the ward lectures deserve mention here.

"Tribute must also be paid to the staff who have faced increasing difficulties. Bed linen has reached vanishing point, ward equipment is steadily wearing out, thermometers are almost extinct, necessitating constant borrowing, only two wards have any light after 2230 hours, and none are adequately lighted at any time. Despite all, the staff in general has carried on cheerfully and uncomplainingly and has maintained a praiseworthy standard of nursing efficiency and of devotion to duty."

The remaining three months can be summarized in the phrase: "The same, only more so." The camp became steadily more crowded ("all men move up"), food became shorter (Table V), men became thinner and less able to

TABLE V.
Daily Ration for July, 1945.

Food.	Amount in Grammes.
Rice—	
Workers	223
Non-workers	192
Sugar	14
Oil	48
Malze—	
Workers	47
Non-workers	38
Spinach	146
Tapioca root	40
Cucumber	4
Sweet potato	7
Yams	45
Fish (dried)	12
Kangkong	25
Black beans	3
Ragi	7

work. At Kranji we had less food than at the main camp at Changi, as we had a greater percentage of sick, who received a far lower Imperial Japanese Army ration than did workers; in consequence, we averaged out at a

low level. And so, for many the end came in the nick of time.

Morale, however, was high all the while. Apart from the fact that we knew we had the measure of the Japanese, other reasons were worth citing. Firstly, entertainment was kept up and ward lectures remained a conspicuous and valuable feature of Kranji life. Secondly, the black market was used as extensively as possible, with the approval of the commanding officer, but with rigid restrictions. As a result, valuables and selected clothing were sold for food; prices were fantastic, but many were able to help themselves a lot, psychologically perhaps more than physically, by this means. Finally, the "laggi fires" ("laggi" is Malay for more) became an institution. Wood was extremely scarce, but every chip, twig and even leaf, was saved, and at odd hours of the day, according to time available, fires were lit through the lines and all sorts of messes were cooked with very primitive materials, often amounting to little more than roughage. Usually, portion of the camp meal was saved and recooked with palm oil, green leaves and so-called curry powder; but there were many variations in the forms of soups, stews, pasties and the like. Great culinary inventiveness was revealed and as practically everyone had a share in a laggi fire, there was keen competition, and the flip to morale was of course great, even though the dietetic value was questionable.

Of the lighter side of our life, I regret I cannot tell here. Time often hung heavily; but I firmly believe that most of those who went through the captivity will be content, in the sober reflection of the aftermath, to write it all off to experience.

SOME MEDICAL EXPERIENCES AS A PRISONER OF WAR.¹

By N. H. ROSE,
Sydney.

It is difficult to compress into fifteen minutes the many and varied experiences of four years, but I thought that tonight a brief description of the workings and doings of a mixed prisoner-of-war hospital would be of interest.

In October, 1942, another British medical officer and myself went to work at a newly opened prisoner-of-war hospital on the Oder River, in upper Silesia, Germany. If you will pass your minds back to those dark days, you will recall that our stocks were then at their lowest ebb. In Africa, the British troops had been thrown back to El Alamein, and feverish preparations for the defence of Egypt and the Suez Canal were being made; the Atlantic saw the U-boat menace at its peak; in Russia, Leningrad was invested, Moscow was threatened and a deep wedge was driven towards Stalingrad in the south. Australia was having its first taste of war in the immediate vicinity. Our enemies were "on top", and this was reflected very clearly in the treatment of beaten people in general and prisoners of war in particular.

Our five hundred bed hospital in the centre of the rich Silesian industrial area was intended to cater for the medical needs of about 55,000 prisoners of war employed as slaves in construction gangs, quarries, coal mines *et cetera*; 40,000 were Russians, 9,000 were British and 6,000 were French. Conditions, particularly amongst the Russians, were to say the least deplorable; all prisoners of this nationality showed gross evidence of starvation. Protein lack oedema was the rule, lice and bugs were ubiquitous. No attempt had been made to segregate the patients with different diseases as they lay in their double and triple deck bunks. Patients with fractured spines, fractured femurs *et cetera* were mixed with others suffering from pneumonia, tuberculosis, typhus and other infectious diseases. Beating of sick patients was common and the death rate was high. A definite attempt was being made by the Germans to exterminate Russian prisoners,

¹ Read at a meeting of the New South Wales Branch of the British Medical Association on March 15, 1946.

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particularly those who might prove potential leaders in the future. Russian officers, including doctors, Jews, and indeed any man with a secondary school education, were picked out for special attention. The treatment of the Russians can be judged from the official figures; of about 7,000,000 who were transported to Germany, 750,000 were alive at the cessation of hostilities. These were the conditions as we found them in October, 1942.

Our first and most pressing need was to gain control of the internal organization of the hospital. As we had gone there as volunteers to look after the needs of Russian prisoners of war, we insisted that we would work there only under certain conditions—first, that the beating of sick prisoners should cease immediately, and secondly, that the Germans should not interfere in any way with the internal administration of the hospital. After much discussion we gained our point, and from that day onwards conditions began to improve—so much so that by January, 1945, we had what was described by the Swiss representatives as the best prisoner of war hospital in Germany.

Our next problem was the provision of orderlies. The keenest and most alert patients were picked out. At first responsible only for the cleanliness of their assigned wards, they were later trained as operation room assistants, dressers, nursing orderlies and post-mortem room attendants. Cooks, gardeners, painters, laundrymen, bathroom attendants and barbers were also appointed. Language difficulties at first hampered our efforts, but it is amazing what can be done with a smattering of words and the so-called "corps of signals" method. My own operating theatre assistants were two young Russian soldiers—one in civil life a fisherman from Astrakhan on the Volga, the other a farmer from central Siberia. For efficiency I would back these men against any theatre sister in Sydney.

Patients were segregated into various wards according to their diseases—post-operative care, fractures, sepsis, tuberculosis, gastric disorders, pulmonary and infectious diseases. Adequate food, of course, was the most vital need. Many Russian patients in the early days came into hospital moderately well nourished, only to die in hospital from starvation. Red Cross food packets, provided for the British but not for the Russians, saved literally millions of lives. Some of this food was smuggled to the sick Russians to supplement their meagre diet of turnip and cabbage soup and a little bread. The announcement of the German debacle at Stalingrad coincided with a liberal increase in the ration to sick patients. This was thereafter referred to as the "Stalingrad diet"—an excellent example of how our treatment fluctuated with the tides and fortunes at the battle front.

A garden was started with seeds bought on the black market; in one season 12,000 pounds of tomatoes were grown by the twenty convalescent gardeners. Money used for the various black market transactions was raised in a unique campaign. Under the terms of the Geneva convention, British prisoners of war were paid about half a mark per day for their work. The 9,000 British in our district were canvassed, and subscriptions towards the support of hospital facilities were sought. Our place thus became one of the few "voluntary hospitals" under prisoner-of-war conditions. In one year, the equivalent of £2,000 was donated, as well as cigarettes, tobacco, food and old clothing. The money was used for the purchase of drugs, food, surgical and musical instruments, electrical fittings, paint *et cetera*. A sports field was obtained from a nearby farmer at the annual rental of seventy marks *plus* all the contents of our sewage pits. Our excreta, which owing to our carbohydrate diet were copious, could not be truly classified as waste nitrogenous matter. From our working fund and the personal efforts of convalescent patients were built and equipped an orderly room, two operating theatres, a pathology laboratory, a post-mortem room, a diet kitchen, a laundry, and last, but not least, an open-air bandstand. In the latter days musical recitals were a regular feature on the week's programme.

For the major part of the time, the medical work was performed by six medical officers who constituted a real

League of Nations. All hailed from different parts of the globe. France, Serbia, Russia, Scotland, New Zealand and Australia were represented, whilst a South African padre attended to our spiritual needs. Never has such a motley collection lived so amicably together.

The surgical care of all the British and half the Russians admitted to hospital—that is, 150 in all—was my responsibility. Naturally, no man gained admission to hospital unless he was seriously ill. The following figures, obtained from records which I was able to bring out, indicate the amount of work carried out. During a period of fifteen months, I performed 375 major operations, including 83 appendicectomies, 41 herniotomies, two gastrectomies, seven craniotomies, and amputations, thoracotomies, tonsillectomies and open operations on fractured limbs—in fact, most types of operation performed by civilian surgeons had to be coped with. As to minor procedures, 51 cystoscopies were performed and over fifty blood transfusions given. Amongst the British patients, no deaths occurred over a period of fifteen months. It was indeed a fertile field for the man interested in traumatic surgery, for 300 patients with major fractures came under my care.

Conclusion.

To conclude this short talk, my impressions of Russians would interest you. As individuals—I cannot speak of them collectively or of their politics—I know of no people for whom I would rather care. Their spirit, patience, discipline, intelligence, gratitude and loyalty were outstanding. I hope that our statesmen and governments will cooperate in the spirit in which we, as individuals, cooperated in the past four years.

EXPERIENCES AS A PRISONER OF WAR IN JAPAN.¹

By S. E. L. STENING,
Sydney.

My ship was sunk shortly after midnight of February 28, 1942. The survivors were in the oil-covered water for anything from seven to fifteen hours, and for this reason most of the severely wounded failed to live through the night. A Japanese destroyer rescued many, who, on reaching the destroyer's deck, were stripped and searched. The oil-soaked clothing was immediately jettisoned. Thus we began our prisoner-of-war life, quite naked, but well covered with oil, some wounded, but with no dressings or instruments at all.

After a day in the destroyer we were transferred to a prison ship. Over 300 men were crammed into one hold, and here we lived, ate, washed on two occasions, slept and tried to care for the wounded and sick. Some materials were acquired from the Japanese, but my entire stock of drugs, dressings and instruments fitted into a cardboard shoe box. However, owing mainly to the sterilizing effect of the fuel oil and salt water, most wounds remained clean during our week on board. There was only one death; this was from ruptured viscera caused by a torpedo explosion near the man in the water.

From this ship we were taken to a town in western Java, jeered at by the native populace *en route*. Here about half were lodged in the local native gaol and half were housed in the cinema. The gaol was of concrete, and we found it very difficult to rest on those concrete slabs, without clothing or pillow. The medical officers were locked behind the bars and could do no medical work for ten days, during which time most of the hitherto clean wounds became septic. After ten days my daily duty took me, barefoot, on a hot tarred road, to the cinema about a third of a mile away, where I did a daily "sick call" for well over 100 men. Dressings and medicines were

¹ Read at a meeting of the New South Wales Branch of the British Medical Association on March 15, 1946.

extremely scarce. I had one pair of dressing forceps and one pair of scissors, and with these I had to remove shrapnel and do other minor surgery. For treating dysentery and diarrhoea there was a half-kerosene tin of magnesium sulphate and a small supply of charcoal. Malaria soon appeared, and for this there was a bottle of some 200 tablets of quinine—this for some 600 men. Food was in microscopic amounts twice a day, but was supplemented by those few who had negotiable currency.

There were only two deaths in that so-called camp in the four weeks during which I was there, and then twelve other officers and myself were taken to Batavia, thence to a ship and sent post haste to Japan. Once arrived in Japan, this small party was taken straight to an interrogation camp near Yokohama. In this camp communication with the other prisoners was absolutely forbidden, the diet was about 1,200 Calories a day, and here our party languished for five months. I attempted to assume the position of camp medical officer, until a difference of opinion with the Japanese naval medical orderly led to both the patient and myself being severely beaten with sticks as the "star turn" of a special parade.

Soon after this, in May or June—that is, three or four months after capture—deficiency diseases began to appear. Some men developed oedema and some developed signs of pellagra. The latter complaint was a most intolerably itchy, weeping eczema of the scrotum. I can assure you that a summer can be most uncomfortable when one is suffering from that complaint.

It was while we were in this camp that we were told that we were not prisoners of war, but still the enemy, the only difference being that we were now unarmed, and that we would not be prisoners until we entered a recognized prisoner-of-war camp. We were treated accordingly.

We became prisoners officially when we had the great good luck to be sent to the next camp. There were many medical officers in this camp, both American and Australian; but only two Americans were allowed to practise. After some two months' rest and recuperation here, a special party of doctors and orderlies was hurriedly organized and sent to the west to the relief of prisoners brought to Japan in a "hell ship". This ship had left Singapore with over 1,000 prisoners aboard; 80 had died between Formosa and Japan from starvation and dysentery. A further 200 or more died after Japan had been reached. With scanty materials we had to try to nurse back to health men suffering from most severe dysentery and malnutrition. Our party stayed three months on that job, and less than 60% of our patients walked out with us. The remainder are buried somewhere in Japan.

For the next few months our small party of eleven travelled to several other camps for like emergencies. Train travel was quite interesting. The Japanese civilians never interfered with us, and our guards always made sure we had a comfortable seat by forcibly ejecting the appropriate number of civilians. Touring Japan came to a close in October, 1943, when I was sent to a new camp on the north coast of Honshu Island, and it is about some of the medical problems I encountered there that I should like to talk.

This camp was originally one of 200 men, but another 100 arrived in January of the next year. The men began their sojourn in Japan in fair condition, but soon they were being laid low by the severe climatic conditions and hard work. It was soon the camp with the worst health record in Osaka area, owing to diarrhoea and deficiency diseases.

Diarrhoea.

Diarrhoea soon became almost universal. It is certain that a considerable proportion of the prisoners suffered from chronic bacillary and amoebic dysentery—about 30% of those in the camp, I should judge. But it should be noted that I was never able to do more than inspect the stools and the patient, so my figures may be quite wrong.

As I have said, diarrhoea became universal, and this was the commonest type: it was a diarrhoea directly

related to diet, especially a diet containing an excess of indigestible matter—for example, soya beans, wheat, or a species of partly hulled rice known as "rubber rice". The men were starving hungry and used to eat leaves and grass, berries and acorns, with dire results. Such a meal lay heavily in the gut of the consumer, and after four or more hours he would begin to feel "bloated" and to eructate huge quantities of foul gas. Diarrhoea soon followed, and before long the sufferer was dehydrated, weak and suffering agonies from colic. The stools consisted of about a litre of brown fluid containing much undigested food, sour-smelling and bubbling merrily from fermentation. One could usually tell the exciting factor of the attack by inspection of stools, for much matter was excreted unchanged.

In treatment, a preliminary dose of castor oil if available gave excellent results, while magnesium sulphate prolonged the attack into the second week. The drug of choice was "Carbarsone", one capsule being given once or twice a day for two or three days. The sulphonamide drugs—sulphaguanidine, sulphadiazine and sulphathiazole—were also efficient even in as small doses as 0.5 gramme twice a day.

The diet was reduced to a minimum; but meat and fish were never withheld even in the most severe case. It seemed so important that each man should have his last milligramme of protein that I encouraged the patients to eat their meat or fish in the hope that some at least might be retained.

The attacks of diarrhoea aggravated any existing vitamin B deficiency and often precipitated an exacerbation of clinical beriberi.

The Deficiency Diseases.

In this camp of 300 men, I had under treatment at one time (May 17, 1944) 209 suffering from beriberi, 156 suffering from pellagra, 120 suffering from defective eyesight, and eight suffering from nerve deafness.

Beriberi.

All the 209 men suffering from beriberi had oedema of mild or severe grade. In some of these cases the condition could not be distinguished from starvation oedema, but since this condition appeared to pass slowly into the final stage of wet beriberi, I did not try to dissociate them. A tremendous quantity of vitamin preparations was needed to treat these men, so, since there was only a limited supply, the drugs were rationed according to the severity of disease.

In my experience the presence or absence of reflexes meant little in the diagnosis of beriberi. Some of the most severely affected patients I saw, who died by drowning in their own fluids, had a positive reflex until a few days before death.

Bradycardia was the rule, pulse rates below 40 per minute being common. Any sudden rise in pulse rate was of bad prognostic significance; but men sometimes died with pulse rates of less than 30 per minute.

Blood pressures were always low, the lowest being 88 millimetres of mercury, systolic, and 64 millimetres, diastolic.

The severest cases of beriberi appeared after an attack of diarrhoea or pneumonia which had been treated with sulphonamide drugs. The effect of all the sulphonamide drugs, even in as small dosage as one gramme per day for two days, was to cause an exacerbation of the oedema, usually after a latent period of a week. Sometimes this exacerbation was pronounced, with oliguria, anasarca, ascites and hydrothorax. I considered then that the cause was a combined liver and kidney failure from the toxicity of the drugs used; but I now know that the cause is the destruction of the intestinal bacteria and subsequent failure of certain vitamins.

In treatment huge doses of thiamin hydrochloride up to 120 milligrammes per day (50 milligrammes by intramuscular injection) had only slight effect. Other means tried to promote diuresis were the use of sodium caffeine

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MAPHARSEN (meta-amino-para-hydroxyphenyl arsine oxide (arsenoxide) hydrochloride) offers another great advantage in that its solution does not become more toxic on standing, nor does agitation or exposure to air increase its toxicity. Stokes² states that no loss of efficacy or increase in toxicity results when the solution is allowed to stand for several hours exposed to the air. Therefore, haste need not be made in preparation of the solution for injection.

¹ U.S. Nav. M. Bull., 45: 783, 1945, and previous annual Navy reports.

² Stokes, J. H., Beerman, H., and Ingraham, N. R.: *Modern Clinical Syphilology*, Ed. 3, Philadelphia, W. B. Saunders Company, 1945, pp. 359, 300.

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SYDNEY

benzoate, "Salyrgan", urea, "Scillaren" (a preparation of squill), digitalis and hot kidney packs; all these had little effect. Restriction of the intake of fluids, even to total prohibition, until the tongue was dry, brown and cracked, gave good results. Salt restriction was unnecessary, since we rarely had any salt. A diet rich in protein was tried; eight to twelve ounces of canned meat product with 130 grammes of bread and a little fluid gave the best result of all in the only case in which it was tried. Unfortunately supplies were not enough for another case.

Paracentesis abdominis and *paracentesis thoracis* were performed frequently. The loss of protein in this form of therapy was serious but unavoidable.

In this camp of which I am speaking, over a period of eight months, there were 41 patients with ascites, nine of whom died; of these 41 patients there were 21 who were subjected to *paracentesis abdominis*, of whom nine died. There were nine subjects with pleural effusion, of whom one died; while of the four men who underwent *paracentesis thoracis*, none died.

My most severe non-fatal case was that of a Canadian, who was in hospital for over six months with anasarca, hydrothorax and ascites. This man ran the gamut of all treatment, including huge doses of thiamin, riboflavin and nicotinic acid. He suffered *paracentesis abdominis* more than 40 times, over 161 litres of fluid being removed; 300 millilitres of fluid were also removed from his thorax. This was the case in which the high protein diet was so successful. The patient was oedema-free when last examined.

Pellagra.

The most prominent symptoms of pellagra that I saw were as follows: glazed tongue and angular stomatitis; dark, fish-scale skin; eczema of the scrotum; defective vision; painful feet; *diabetes insipidus* and polyuria; mental deterioration.

Now the syndrome of "painful feet" may be present without other signs of pellagra. This syndrome presents with burning, tingling, shooting pains and numbness in the toes, feet and legs, and occasionally the hands. This condition led to much misery, sleeplessness and even death from pure exhaustion. Relief was found from exposure to cold, and so these men used to sleep, in winter, with their feet poking out from under their blankets; they walked barefooted on frozen ground and soaked their feet in icy water. The result was gangrene, analogous to the "trench foot" of the last war. The skin of toes, whole toes and even feet would become gangrenous and separate after a period of months. Of the 300 men in camp, no less than 85 were affected in some degree in the months of December, January and February.

The loss of sleep from the "painful foot" syndrome was much diminished during the winter months, since most of the men had partly frozen feet with complete anaesthesia almost to the knee. There was no way of avoiding the frozen feet, since the men had to go to work; many had no socks, their boots had worn out, and they were wearing Japanese canvas and rubber boots which remained wet until the snow and slush of winter had passed. These men had to work in snow and water, exposed to icy winds, with little clothing and poor food for all that dreadful winter. Finally, when rubber knee boots were provided late in February, it was found that many men were too weak to lift one foot after the other in them, and so they had to revert to their smaller, wet, canvas boots.

In that camp, out of 200 original workers, 36 or 18% lost their lives from exposure, diarrhoea and malnutrition, including one man who froze to death under eight blankets.

Another symptom of pellagra that I should like to mention is the frequency of micturition and enuresis which occurred. *Diabetes insipidus* is stated to be a symptom of pellagra, and these men certainly had it. A diet of soup, boiled grain and tea supplied a sufficiency of fluid, which was eliminated gleefully by efficient kidneys. The men's bladders became increasingly sensitive, and it was no uncommon thing for a man to get up and pass urine fifteen

times in a night. Some men found it impossible to hold their urine until they reached the latrine, and they eventually reached a stage when they passed their urine in bed through sheer exhaustion. As these men slept in every stitch of clothing they possessed, all their clothing, blankets and mats became wet, smelly and sodden with urine. Punishment was their lot when this state of affairs was discovered on inspections. You can imagine the feelings of the Japanese when a urine-soaked sleeping mat produced a fine crop of mushrooms early in the summer.

Comment.

I have mentioned only a few of my experiences; other camps were similar, and so I close, hoping that I have given you an idea of my last visit to Japan.

SURGICAL EXPERIENCES AS A PRISONER OF WAR.¹

By K. J. FAGAN,
Sydney.

MAY I begin with a controversial statement? It is this: that the returned prisoner of war is in most cases not only a normal man, except for some temporary physical disability, but one who has had intellectual and emotional experiences which give him a decided advantage over his fellows. He has learned to appreciate the minor pleasures of life. He knows the essentials of existence. He has a high threshold to the pin-pricks of ordinary life. He knows man for what he is—his courage, his cowardice, his limitless generosity, his gross selfishness, his nobility and his utter meanness. And if he tends towards cynicism at the discovery of the relation of man's best qualities to his intragastric tension, he is robbed of all bitterness by the memory of the heights to which he has seen some men rise in spite of starvation, of illness and of every degradation which a malignant enemy could put upon them.

At the relief of Singapore in September, 1945, the Press was in the vanguard. My first contact with the outside world was with one of its representatives, who curtly brushed aside all my perhaps incoherent demands for news with the request: "Come on, Major, tell me a horror story." I did not tell him a horror story, nor do I propose to tell you a horror story; but in a talk on surgical experiences as a prisoner of war, some account of the background is necessary.

Our first surgical task after imprisonment was the care of battle casualties. In Singapore we were fortunate in that for the first few months we had an X-ray plant, plaster, anaesthetics and equipment, so that we were able to treat these casualties *secundum artem*. Our difficulties were malnutrition and intercurrent infections, particularly dysentery. One frequently had the experience of losing a patient from acute dysentery after months of work at a stage when his injuries were satisfactorily dealt with. A timely shipment of South African Red Cross food saved many of our battle casualties. It enabled us to feed them normally for a long enough period to restore their powers of resistance and healing.

In May, 1943, I was detailed as surgeon to a party of 3,500 troops travelling north to Siam to work on a railroad. After a protracted and uncomfortable railway journey to Bampong in southern Thailand, followed by a most arduous march of 120 miles into the jungle, our men were set to work without being allowed time to recover from the journey. They worked for twelve to fifteen hours a day, making a cutting through solid rock with picks, shovels and hand-drills. Their rations were grossly deficient in proteins, fats and vitamins, particularly thiamin and the

¹ Read at a meeting of the New South Wales Branch of the British Medical Association on March 15, 1946.

B₂ complex. The region was highly malarious; the native population was admitted by its own government to consist of 100% amebiasis carriers. Very soon our men were reduced to the status of a malarious, dysenteric, underfed and overworked slave gang. An epidemic of cholera killed 25% of the camp strength in six weeks. With this classical background an epidemic of acute phagedenic ulcer appeared three weeks after our arrival in Thailand. The ulcers developed sometimes spontaneously, sometimes as a secondary infection of a scratch or cut. The spontaneous ulcers appeared first as a small vesicle surrounded by an area of redness, induration and tenderness. After twelve to twenty-four hours, the vesicle burst, discharging a little sanious material and exposing a sloughing base, which spread with varying rapidity and to a varying depth. In the more severe cases there occurred progressive destruction of skin, subcutaneous tissue, deep fascia, tendon, intermuscular fascia, periosteum and bone. Muscle was relatively immune. The spread of the lesion was accompanied by intense pain and moderate toxæmia. A man with a severe, untreated ulcer presented an appalling spectacle. One saw a pale, wasted man with a flexed knee and a thin strip of intact skin down the calf or outer side of the leg, the rest of the leg being the site of a huge ulcer from which poured offensive, greyish pus; sloughing tendons and fasciæ were exposed, the muscles were tunnelled and separated by gaping sinuses, the whole of the tibial shaft was sequestered.

Conservative treatment was slow and troublesome. It was found that the best treatment was early excision of the necrotic tissue. If one could excise this before the deep fascia was penetrated, cessation of the necrosis, the appearance of healthy granulation tissue and healing, perhaps in the case of larger ulcers with the aid of skin grafts, could be confidently anticipated. Operation in these cases was followed by immediate cessation of pain. Once the deep fascial barrier was penetrated, secondary operations such as excision of necrotic tendons and sequestrectomy were often necessary. In the advanced cases, such as that described above, amputation was the only possible treatment; but the mortality rate was very high. The association of chronic diarrhoea was a particularly lethal factor. However, amputation enabled many of these unfortunate men to die in greater comfort and dignity.

The facilities available for surgery in the Thailand prison camps were not elaborate. My operating theatre, for example, was at first the open air, later a tent fly, and still later, when we returned to the plains at Kamburi, a luxurious affair of palm leaf with a mud floor, but completely fly-proofed with American Red Cross mosquito netting. Sterilizing of towels, instruments and dressings was done in a four-gallon "dixie" on an open fire outside the operating theatre. Under these conditions, in addition to excisions of ulcers, such operations as appendicectomy, mastoidectomy, craniotomy, "pinning" of the tibia and skin grafting were performed with a minimum of septic complications. This fact was due to the skill and devotion of the theatre orderlies, who fortunately had received their training in better circumstances and earlier in our captivity.

I should like to close with the surgical lessons that I learned as a prisoner of war. The first is that the necessary surgery can be performed in any circumstances, provided fuel and water are available, and provided one has an operating theatre staff adequately trained and accustomed to improvisation. The second is the value of the Steinmann pin in treatment under primitive conditions of fractures of the lower limb. Its simplicity and portability make it invaluable where no plaster, strapping or bandages are available. The third is the value of chloroform as an anæsthetic agent under conditions of tenuous supply lines. It is safe in good hands, and economical. One can carry a large number of "chloroform anæsthetics" on one's back. The final point is that male medical orderlies can be trained to the same standards of efficiency and skill in operating theatre technique as women, and that it should not be necessary ever again to expose our women to the danger of captivity at the hands of an Asiatic enemy.

Reviews.

PSYCHOLOGICAL MEDICINE.

THE second edition of Curran and Guttman's "Psychological Medicine" is larger than its predecessor by some sixty pages, and the sections on constitutional factors, psychopathic personality, affective and hysterical syndromes have been rewritten and extended.¹ The diagram taken from Kraepelin indicating the age incidence of mental disorders has been omitted. It was misleading, but the authors might well have substituted a graph indicating the incidence of major mental disorders in relation to the general population living at various ages. The authors rightly emphasize the need for students to supplement their theoretical knowledge by examining patients for themselves, and express the fond hope that better opportunities will be provided to this end. The expression "vulnerable" as applied to psychopaths is apt and a fair example of the authors' success in giving instructive pen pictures of the various clinical types. In the anxiety states, stages are described of over-reaction, established tension, somatic fixation and exhaustion, with depression. Perhaps the somatic manifestations of this psychoneurosis might with benefit have been elaborated further. Incidentally, the spurious new concept of psychosomatic medicine is the subject of some comment not altogether free from sarcasm. Obsessional states are dealt with in a separate chapter in this edition. Mental defect occupies some sections in the latter part of the chapter on psychopathic personalities, but a section on the moron in wartime towards the end of the book, like other matter in the chapter on psychiatry associated with war conditions, contains many observations applicable to civilian practice. Throughout this work the student is spared the refinements of psychopathology, and for that matter, of physical pathology, too, and is given a sound general foundation which can be amplified by experience and further study according to the type of practice which he takes up. The appearance of a second edition is proof enough that this work is filling a need in psychiatric literature.

PROGRESS IN UROLOGY.

UROLOGISTS will welcome the record of progress set out in "The 1945 Year Book of Urology", edited by Oswald S. Lowsley.² This is a carefully compiled selection of abstracts of articles on urological subjects during twelve months. As usual the work is divided into several sections. The first deals with general considerations, and here under the heading of anuria mention is made of a case in which sulphonamide anuria was due to nephrotoxic effects of the drug rather than to mechanical obstruction. In the section on the kidney and adrenal reference will be found to nephrosis and nephritis and to the conception of gradual rather than essential differences between them. The pathological basis for clinical manifestations in nephritis is also discussed. Amicrobic pyuria is described with its treatment by neosarsphenamine. In the section on the ureter a good deal of space is given to an account by Jewett of a modification of his method of uretero-intestinal anastomosis for cancer of the bladder. A method by Vose for the use of rubber T-tube ureterostomy as an adjunct in uretero-enterostomy is illustrated. In the section on the bladder two important articles on rupture of that organ are abstracted. The section on the prostate is excellent. Carcinoma of the prostate and its treatment by different methods are discussed. Young's radical perineal prostatectomy is described and illustrated. In the section on the genitalia a good deal of space is devoted to male infertility. A section of gonorrhoea is the last in this useful book.

¹ "Psychological Medicine: A Short Introduction to Psychiatry, with an Appendix on Psychiatry Associated with War Conditions", by Desmond Curran, M.B., F.R.C.P., D.P.M., and Eric Guttman, M.D., M.R.C.P., with a foreword by J. J. Conybeare, D.M. (Oxon.), F.R.C.P.; Second Edition; 1945. Edinburgh: E. and S. Livingstone Limited. 8½" x 5½", pp. 254, with illustrations. Price: 10s. 6d., postage 6d.

² "The 1945 Year Book of Urology", by Oswald S. Lowsley, M.D., F.A.C.S.; 1946. Chicago: The Year Book Publishers, Incorporated. Melbourne: W. Ramsay (Surgical) Proprietary. Limited. 7" x 4½", pp. 416, with illustrations. Price: 24s.

The Medical Journal of Australia

SATURDAY, JUNE 1, 1946.

All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given without abbreviation: initials of author, surname of author, full title of article, name of journal, volume, full date (month, day and year), number of the first page of the article. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors who are not accustomed to preparing drawings or photographic prints for reproduction are invited to seek the advice of the Editor.

THE STAFFING OF HOSPITALS: A STATEMENT FROM ENGLAND.

DURING the last three or four years one of the most urgent problems of civilian life in Australia has been the staffing of hospitals. The difficulty has been presented almost entirely by the nursing and domestic staffs. Everyone knows that hospital wards and sometimes whole hospitals have had to close either because a shortage of trained nurses or of probationer nurses existed, or because recruits to the domestic staffs could not be obtained and the nurses who were available were not able to carry out domestic duties as well as those connected with nursing. Readers will recall that the Federal Council has discussed the problem time and again and that during the war, especially towards the end, representations were made to Ministers in regard to the release from the armed forces of certain personnel and also in regard to the assignment of a high "priority" to hospitals in the matter of the employment of women suitable for service on their domestic staffs. Though the war has ended and many women have been demobilized, the problem is still acute. This problem is not peculiar to Australia; it exists in many other countries and is not entirely to be credited to the disturbance of war. As so often happens, we may find that light is thrown on our own difficulties if we give consideration to the way in which other places are affected and to the measures suggested for adoption in those places. A brochure has recently been published for the Minister of Health of Great Britain, the Secretary of State for Scotland and the Minister of Labour and National Service,¹ and should receive attention.

In the foreword which bears the signatures of the three ministers, it is stated that the situation in Great Britain is already extremely serious and that it is likely soon to become critical unless some thousands of recruits are quickly obtained for the nursing and domestic staffs of

hospitals and similar institutions. An idea of the extent of the problem in Britain is shown by the statement that the total number of nurses and midwives required to staff the present nursing services of the country is about 240,000. There is a great shortage. If the notified vacancies only are considered, at least 30,000 more nurses and midwives are needed, most of them for hospitals. Further, there are about 12,000 immediate vacancies, mainly for women, in domestic and other hospital work. Thousands more domestic workers would be needed if nurses could be obtained and the wards now closed could be opened up. The shortage extends to all types of hospital, including maternity hospitals, but is most acute in such institutions as those for the tuberculous, those for the care of the chronically ill and mental hospitals. The shortage is not the whole problem. The position is aggravated by the fact that a reshaping and expansion of hospital resources will be necessary when the intended comprehensive health service for the nation is introduced. The point is made—and it is worthy of emphasis—that hospitals are not only in need of emergency help but that they are offering long term employment to people of the right kind. The phrase "right people" sounds well. Generally speaking, the experience in Australia is that women who undertake training to become nurses are of the right kind. They show this by their efficiency and by their reliability. There is a trend, however, among many trained nurses to seek employment in other spheres where work is not so arduous or so exacting and where a comfortable living is more easily earned. This is mainly the result of the present conditions of service. The present shortage in Britain is due to a combination of causes. New forms of health service have been developing and more and more is being done for the health of the people; this means naturally that more persons are needed for the work. Industrial nursing and school nursing are two avenues in which more nurses have been employed, and as time passes we shall find that industrial undertakings and schools will in this country help to deplete the numbers of those available for work in hospitals. In Britain there has been an increase of over 170,000 births per annum since 1940; this means that more nurses are needed. These facts make it easy to understand that more hospital beds are occupied in Britain than before the war and that many thousands are awaiting admission. Since we read that in some places whole wards are empty because of lack of staff, we must conclude that more hospital beds have been created. It would be interesting to know whether Australia has more hospital beds now that the war is over than were available before the war. Hospitals have been created for the services and we are surely safe in concluding that if these are counted, the total is much higher than it was in 1939. Naturally we must ask whether any of the service beds cannot be devoted to civilian use—that is to say, whether some of the service hospitals should not eventually be handed over, lock, stock and barrel, to civilian authorities. At present we are probably at one with Britain in our involvement in the vicious circle caused by the shortage itself—"short staffs mean overworked staffs and strained working conditions; thus wrong impressions of the real nature of hospital life and work are created and people are discouraged from choosing that life".

Since the provision of a comprehensive health service has been mentioned, two alternatives present themselves

¹ "Staffing the Hospitals: An Urgent National Need", published for the Minister of Health, the Secretary of State for Scotland and the Minister for Labour and National Service; 1945. London: His Majesty's Stationery Office. Sydney: Angus and Robertson Limited. 8" x 5½", pp. 19. Price: 6d.

when a search for a solution of the problem is made. Either the provision of a comprehensive health service must be abandoned or postponed, or new recruits to the profession of nursing must be obtained. The first is mentioned only to be dismissed at once; the recruitment of nurses remains. If many more women are to embrace the calling of nursing, the work must be made more attractive. Some persons might add to this the lowering of the educational standard at present required of recruits to nursing and also the adoption of a more lenient attitude in the marking of examination papers which have to be faced by every nursing trainee. Such a suggestion as this should be rejected out of hand, for the great value of nursing today and the high esteem in which members of the nursing profession are held can be attributed only to the knowledge, understanding and intelligence of trained women. It would be better to establish a permanent second grade of nurse, to whom the simpler duties in a hospital ward might be allotted, than to lower the standard of attainment of fully trained nurses. Something of this kind has been done in England. A Civil Nursing Reserve was formed before the war, "to recruit an additional supply of trained nurses, assistant nurses and nursing auxiliaries for war-time needs". Most of those who joined this reserve did so as a war-time service. Though the war has ended, the reserve is being maintained. Members of the reserve who are considered suitable are allowed to enter a period of training to become registered nurses and are excused six months of the training period. (In one or two of the Australian States a similar kind of arrangement exists with regard to members of the Australian Army Women's Medical Service.) Britain also has another grade of service, that of assistant nurse, which is open "to that numerous body of men and women who have the vocation and the aptitude for nursing, but who do not feel able to undertake the full course of training and the examinations required for State Registration". Those who can show that they have adequate knowledge and experience in the nursing of the sick and can produce evidence of good character are admitted to the roll of assistant nurses by the General Nursing Council. Eventually admission to the roll will be conditional on training and on the passing of a simple, mainly practical, examination. The British Government thinks that the steps mentioned are still not enough and that new and greater efforts are required. These efforts will be in the direction of improving the general conditions of nursing. There is a great deal that is unsatisfactory about the conditions under which nurses have to work, the hours that they have to spend at work and their remuneration. These aspects have been discussed in these columns on previous occasions and need not be traversed again. The British pamphlet makes a statement which does not seem to be appreciated as widely as it should be: "The notion of hospital work as devoted endurance of discomfort in a good cause is, of course, entirely out of date." The pamphlet contains two codes of working conditions which are worthy of the critical attention of all who are concerned with the recruitment and training of nurses and with the running of hospitals. One of the codes has to do with nursing services and the other with domestic staffs. Mention is also made of the increased employment of male nurses, of ward orderlies and of the wider employment of married women.

This British document can be of great use to Australian nursing if it is used intelligently. The code dealing with conditions of service is full of information that might serve as a basis for serious discussion on the subject. To deal with nursing in Australia from the national point of view is very difficult on account of the great differences of training requirements and so on existing in the several States. Though we still await a statesman with the vision and driving force needed to achieve national unity in nursing, the States should do what they can in their own spheres to lessen the difficulties of hospitals in their staffing problems.

Current Comment.

THE PROBLEM OF EARLY PULMONARY TUBERCULOSIS.

REFERENCE has been made from time to time in these pages to the problem of dealing with those subjects of early tuberculosis whose condition has been discovered by mass radiographic surveys. The whole question of primary tuberculosis in young adults was well discussed at the thirty-ninth annual general meeting of the Association of Physicians of Great Britain and Ireland. The proceedings of this meeting, held in April last year, have only recently been available here.¹ The particular interest in the handling of what may seem a well-worn subject lay in the fact that a vigorous and practical discussion took place, during which some of the questions asked were just those that we are asking in Australia today. Air Commodore R. R. Trail, in opening the discussion, surveyed the pathology of pulmonary tuberculosis of the young adult, and again pointed out that it was probable that primary infection often produced numerous pinpoint lymphatic foci which escaped detection even by radiological examination. He stated that mass radiological surveys in the Royal Air Force suggested among other things that primary infection of the more chronic type was not dangerous *per se*, and that probably healing took place in two-thirds of the cases. The discussion naturally raised the question of those who did not react to tuberculin, and it was pointed out that exposure of these non-reactors gave rise to primary infection in 78% in a year and in 95% in three years. It is agreed that the non-reactors must therefore be watched carefully, but what are we to do if evidence of infection is discovered later? It is proper to remove these young people from dangerous contacts, if this can be done, but what else? It is, as was clearly stated at this meeting, unphysiological to put these patients to bed. The advice given was that when such an early lesion was discovered, a period of three months' rest in some convalescent institution was wise, after which work could be resumed under supervision. The time of particular danger was within fifteen to twenty-four months. The very practical question was raised: Who pays for this convalescence? Is it at public expense? And is rest at home satisfactory or is a special institution necessary? At present, of course, it is futile to talk of sanatoria, as all accommodation is so woefully deficient, but the opinion was expressed that sanatoria should be available and should be strictly classified. Then what is to be advised in the matter of further investigation? It is known that with modern cultural methods a high proportion of open cases is revealed. Is, then, the application of such methods an obligation on the practitioner on finding an early lesion in a patient who appears quite well? We must not, of course, confuse primary with secondary types of infection, but quite apart from an accurate pathological diagnosis there is the practical problem of the steps to be taken when a young adult, who may appear perfectly well otherwise, is

¹ *The Quarterly Journal of Medicine*, October, 1945.

found to have radiological signs of disease. Suppose he is proved to have an open infection of the lung. In England he can refuse treatment; apparently this is not so in Canada. The person with tubercle bacilli in the sputum is undoubtedly a danger to his intimate associates if these are young and non-immune. Experience at Papworth has shown that these patients with open lesions may live with their families without infecting them, but this is a special case in a closed community. Armand Delisle, who took part in this discussion, would use "B.C.G." vaccine to confer partial immunity in childhood, employing the scarification method.

The question of the control of persons with open lesions was debated. Gradually more drastic methods are being used to eliminate tuberculosis from dairy herds, and while the human being is an entirely different proposition, we must ask ourselves if we should not consider specially those who are yet healthy, but in some danger of not remaining so. Sir Edmund Spriggs instanced the control of leprosy by segregation, though the epidemiological problems concerned may not be quite so simple as the story of leprosy might suggest. He advocated more drastic control of open tuberculosis. It is better, as he says, to place a fence round a dangerous cliff than an ambulance at the bottom. Trail, in closing the discussion, gave one last warning: that patients who have been subjected to mass radiological surveys too often end up in the hands of the psychiatrist.

When very difficult problems have to be faced and solved it is chastening and not unhelpful to find that experienced authorities also realize their great difficulties. But this is a problem that must be tackled. The medical profession must guide the public in this matter and must exert pressure on governments and other responsible bodies; therefore it is all the more necessary that the counsel of its members should be sound and wise and be given with a sure voice.

THE ACTION OF IODINE IN GRAVES'S DISEASE.

Now that the treatment of Graves's disease with thiouracil is a more stabilized procedure, the place of iodine or thyroid gland substance is better understood, though there are still many gaps in knowledge. These gaps are chiefly in our understanding of the mechanisms involved. It will be recalled that twenty years ago the stimulating influence of Plummer did much to reinstate iodine in the treatment of toxic goitre, though his hypothesis of an incompletely iodinated hormone with toxic properties did not stand the test of time and trial by experimental work. But the idea of a two-action theory of iodine in thyroid metabolism has in a broader sense never lapsed altogether, as a Boston team of workers recently has stated. Rulon W. Rawson, F. D. Moore, Wendell Peacock, J. H. Means, Oliver Cope, and Charlotte B. Riddell have produced evidence in favour of the suggestion that iodine may act in its "iodinating" capacity and also, under the peculiar conditions obtaining in cases of Graves's disease, as an involuting agent.¹ Means and Richardson, in 1929, expressed the opinion that the action of iodine in preventing endemic goitre when given in tiny doses was quite different from its action in securing detoxication in exophthalmic goitre. By work along these lines with the new therapeutic weapon of the thiourea compounds and with the experimental weapon of radioactive tracer iodine some interesting results have been obtained. These authors point out that the amount of iodine needed for the iodinating of the thyroid hormone is very small, as little as 0.075 milligramme of iodine per day. In excess of the physiological dose the iodine is simply excreted. This has been found to be the case also in disease not related to thyroid activity in which iodine has been administered in the hope of a therapeutic action, such as rheumatoid arthritis; chemical studies have shown that iodine in excess of the ordinary requirement washes through without further

utilization. But in Graves's disease the position is different, for the avidity of the gland is increased two or threefold, while the dose of iodine necessary to produce involution is some eighty times the amount needed to prevent the development of a goitre due to iodine lack. It is the mechanism of this involution that has not been clear. Rawson and his co-workers point out that the conclusion reached by previous workers has been that the supplying of excess iodine has blocked the delivery of thyroid hormone from the gland to the body, either by cessation of production or by the imposition of a barrier. It was found that the iodine in thyrotoxic glands was greater after iodine had been given, but on the whole it was rather believed that the iodine acted by inhibiting the thyro-tropic hormone of the pituitary. In order to cast further light on this problem the present investigators set out with the concept that thiouracil separated the two phases of the action of iodine, thus making it possible to determine the mechanism with greater accuracy. Special studies were carried out on seven patients suffering from Graves's disease. In four patients biopsy of the thyroid gland was made before any treatment was given, and again after the administration of thiouracil had reduced the metabolic rate to normal level. The histological features of these specimens were compared with those of the glands when removed at operation. Further biopsies were made from three other patients after a therapeutic course of thiouracil; iodine was then given in addition, and then thyroidectomy was performed, the removed glands being again compared histologically with the previous specimens. Tracer doses of radioactive iodine were given to a group of patients before and after thiouracil therapy, and the urinary excretion of this iodine was determined. Finally the total iodine and the thyro-globulin iodine of the gland were determined by analysis after surgical removal. The degree of hyperplasia in the glands examined was assessed by measurement of the height of the acinar cells. The figures in the latter determinations are interesting; the average mean height of acinar cells showing hyperplasia as the result of disease alone was 12.9 micra, this measurement rising to 13.9 after thiouracil, and receding to 7.2 when iodine was administered in addition. Before treatment by thiouracil the excretion of radioactive iodine averaged 25%, whereas during thiouracil treatment the average excretion was 80%. The conclusions arrived at by these authors are as follows. They find that under treatment by thiouracil the hyperplastic gland becomes still more hyperplastic and that this drug prevents the utilization of iodine by the thyroid. But they interpret their experiments as indicating that iodine causes involution of the thyroid gland in Graves's disease in spite of the fact that thiouracil blocks its collection in the gland. Therefore, they maintain, the action of iodine on the thyroid gland in Graves's disease is twofold, both iodinating and involuting, and thiouracil enables these two different functions to be separated.

This question of iodine metabolism is most important and affects the treatment of thyroid disease. Professor Trikojus, in his Syme Oration, put this clearly when he pointed out that whatever the aetiologies of the various forms of thyroid dysfunction, the abnormal conditions found were revealed basically as problems of iodine metabolism at different levels.² The logical reasons for the use of iodine or thyroid substance in addition to the thiourea group of drugs were clearly indicated in this address, and the independent action of thyroxine and goitrogenic agents was stressed. The good results of the growing clinical application of this knowledge have been published by a number of authorities. H. R. G. Poate and S. L. Spencer have recently described their experiences³ and advise that thyroxine or thyroid substance be given as well as thiouracil in order to prevent hyperplasia and inhibit exophthalmos. With the introduction of new modifications of the drugs in use at present and further advances in physiological knowledge the future looks bright for the safer control of Graves's disease.

¹ *The Australian and New Zealand Journal of Surgery*, January, 1945.

² *THE MEDICAL JOURNAL OF AUSTRALIA*, April 13, 1946.

³ *The Journal of Clinical Investigation*, November, 1945.

Abstracts from Medical Literature.

BACTERIOLOGY AND IMMUNOLOGY.

Dangerous Carriers of Haemolytic Streptococci.

MORTON HAMBURGER, JUNIOR, MARGARET H. GREEN AND VIRGINIA G. HAMBURGER (*The Journal of Infectious Diseases*, September-October, 1945) have continued their work by studying spread of infection by individuals from whose noses strongly positive cultures were obtained, and who were known to expel large numbers of haemolytic streptococci. Twelve hospital infections were traced to other patients carrying the same type, and from eleven of these patients strongly positive cultures were obtained from the nose; the twelfth, although there were no streptococci in his nose, expelled large numbers in his saliva. In a small outbreak of sixteen cases of streptococcal pharyngitis or scarlet fever, fourteen infections were found to originate in a barracks, where from the nose of a single soldier a strongly positive culture of the same type organism as the patient carried was obtained, and while many men in the same barracks carried other types of haemolytic streptococci in their throats, it was the one carried nasally which spread. One individual in a barracks carried type 46 in his nose, and had no symptoms of infection. Ten men from the same quarters developed type 46 pharyngitis within the next nineteen days. The carrier was hospitalized and treated with sulphadiazine, and type 46 disappeared, but other types, including type 30, invaded his nose during convalescence. After he returned, four type 30 infections developed in his barracks. Later 106 patients developed type 1 tonsillitis which was traced to a food handler who gave a strongly positive culture of type 1 and was in the incubation stage of sinusitis. The authors believe their evidence to show that nasal carriers are much more dangerous than throat carriers, and also easier to eliminate. They discuss the "communicability" of certain strains, which, however, they do not consider is a transient character conferred on a strain by residence in a certain host, and the association of active sinusitis does seem to have an influence. Positive nasal findings are more important, they believe, to decide a patient's retention in hospital than the presence of haemolytic streptococci in the throat.

Diphtheria in Baltimore.

G. H. ELLER AND MARTIN FROBISHER, JUNIOR (*American Journal of Hygiene*, September, 1945), studied an outbreak of diphtheria in Baltimore in 1944. It was limited to one section of the city, a large number of patients had been given injections of diphtheria toxoid, the disease was severe, often being accompanied by "bull neck", and the mortality was high. Nine of 142 patients died. Two patients only were recorded as having had previous tonsillectomy, and a school survey showed that the largest number of cases occurred where there was the smallest percentage of prior tonsillectomy. The records of the city Health Department showed that 50% of the patients with severe infections had had injections of

toxoid, and amongst those with mild infections the injection rate of toxoid was higher. The study of the cultural types of the organism from the patients did not point to any predominant type; in the serious cases, however, the *gravis* organism was not present. In more than half a *mitis*-like strain was grown, and an irregular strain, named by the authors "*minusus*", was common in the epidemic area at the time of the outbreak.

Diphtheria Bacilli in Baltimore.

M. FROBISHER, JUNIOR, M. L. ADAMS AND W. J. KUHN (*Proceedings of the Society for Experimental Biology and Medicine*, 1945) have studied the characteristics of diphtheria bacilli found in Baltimore since November, 1942. Two hundred and ten strains from 500 clinical cases were examined, and of these 169 were virulent. Only one *gravis* type organism was found during the period. It was noted that in many strains the fermentation of dextrose was irregular, and four virulent strains fermented saccharose. During the study a colony form appeared in cultures on tellurite media which differed from the accepted *gravis*, *mitis* or *intermedius* group. It was minute, black or opaque, and had a light peripheral zone. It fermented dextrose slowly and irregularly. No evidence was obtained that it differed in toxin production from other strains, but in experiments with animals the authors believed that protection was obtained by the use of bacillary endotoxic antigens. They called this new strain "*minusus*".

Immunity in Mumps.

JOHN F. ENDERS (*Transactions and Studies of the College of Physicians of Philadelphia*, April, 1945) made a study of immunity in mumps. The disease was produced in monkeys by inoculating into Stensen's duct saliva from human patients in the early stages of the disease. Parotitis developed on the seventh to eighth day. The animals were resistant to subsequent reinoculation, although local reactions were observed in forty-eight hours in some instances. The infected parotid gland was removed and finely emulsified and used as an antigen, and was found to fix complement in combination with serum from convalescent patients, while emulsified normal gland would not do this. Paired sera from infected animals, one specimen taken early in the disease and one three weeks later, were submitted to the test, and while the first often did not react, the second often had a high titre. Some of these animals were serially tested and found to show evidence of antibody as long as twenty-one months after experimental infection. Serological evidence of inapparent infection was found in contact animals who developed antibodies after three weeks with no signs of disease. The antigen could not be found in any tissue other than parotid gland; it was inactivated by heat and killed by formalin, but this did not destroy its antigenicity. In the human disease, similar results were obtained; no antibody was present in the early stages, high titres were found in convalescence, and some individuals with no symptoms of infection showed antibody response up to two years later. In the group of associated diseases which show associated meningo-encephalitis, the

complement-fixation test may well prove useful, since seventeen patients with salivary gland involvement all gave titre of some height, and in ten of seventeen instances a significant rise was recorded during the illness. In some closed children's communities tests were made before and during an epidemic, and it was found that while an occasional infection occurred in a child with antibody, by far the greater number occurred in subjects with no demonstrable antibody before the disease was introduced into the community. Dermal hypersensitivity could also be shown towards the emulsified gland antigen and none towards the normal gland. Change of the result of the test from negative to positive could be seen in the case of patients, and in subjects with serological evidence of inapparent infection, and correlation also appeared in persons with a past history of mumps, and on the occurrence of infection in subjects who gave a negative reaction to skin tests. Exceptions were encountered, however. Experiments with formalized antigen for the production of active immunity both in monkeys and children have given encouraging but not conclusive results, evidence of antibody rise and protection against experimental infection being obtained in a proportion of instances only. The complement-fixation test could be used to contribute information on epidemiological behaviour of infectious disease and the factors concerned in the enduring type of immunity which this type of disease may confer.

Experimental Infection of the Human Body Louse with Typhus Strains.

J. C. SNYDER AND C. M. WHEELER (*The Journal of Experimental Medicine*, July, 1945) have studied the experimental infection of the human body louse, *Pediculus humanus corporis*, with murine and epidemic louse-borne typhus strains. A normal colony of lice was supported on a human volunteer, and then allowed to feed on a typhus-infected rabbit, and thereafter they were nourished only on a rabbit. The method of infecting the rabbit was either by intravenous injection of yolk sac culture fluid or intradermal injection of rickettsiae to form a bleb. This latter was produced by a variety of biological fluids as the suspending medium, serum, blood, yolk sac fluid or serum. The lice became infected quite readily by most of the methods tested. The authors believe that rabbits can replace human hosts for the lice, and that conditions of infection with murine or human typhus rickettsiae can therefore more easily be controlled.

Rickettsial Agglutination in Typhus.

FLORENCE K. FITZPATRICK (*The Journal of Laboratory and Clinical Medicine*, July, 1945) has made studies on rickettsial agglutination in typhus. Her antigens were usually prepared from the yolk sac of infected eggs, the embryo being infected on the seventh day and dying on the sixth to the seventh day afterwards. The emulsions were harvested and formalized, and the rickettsiae were liberated from the cells after four to six days in the ice box. The fluid was then extracted with ether, and the antigen was drawn off and phenyl mercuric nitrate was added to a concentration of 1 in 50,000. Slide agglutination was found to be the most convenient technique, and readings

were made after five hours' incubation in a moist chamber at 37° C. and overnight. Serum from normal people showed no agglutinins towards this antigen, while those from persons with a history of typhus during the previous two years produced agglutination of murine antigen in 104 out of 155 tests. These sera reacted in much less degree or not at all with suspensions of *Proteus*. Two workers developed typhus during preparation of the vaccine, and their sera showed marked rises of agglutination titre. Numerous tests were carried out with murine and epidemic typhus strains on vaccinated animals, and some evidence of cross reactions was obtained, but dilution methods were adequate to establish which strains predominated. No typhus antigen was agglutinated by serum from a patient infected with spotted fever. The author thought the test would be both reliable and useful.

Test for Rh Sensitization.

A. S. WIENER (*The Journal of Laboratory and Clinical Medicine*, August, 1945) has described a conglutination test for Rh sensitization. Some individuals show sensitization to the Rh factor, and yet antibodies against Rh cells cannot be demonstrated in their serum. These patients also have an Rh-blocking antibody, which combines with the Rh antigen, but produces no visible change in the red cells, even after a period of sixty minutes. If to such a mixture a drop of specific anti-Rh agglutinin is added, no agglutination takes place, because the Rh antigen has been blocked off. One method of overcoming this blocking action has been described by Diamond and Abelson, by the use of an excess of the Rh cells. The test here described as "conglutination" differs from the standard method in that all cell suspensions are diluted in serum or plasma instead of in saline solution, that is, in colloid instead of in crystalline solutions; and it may be carried out at room temperature. The action of the blocking antibody is overcome, and sensitization can be demonstrated when serum diluted with saline solution does not yield a reaction. The observations may be correlated with recent facts concerning serum proteins and their behaviour after dilution with saline solutions. The test also provides a method of using low titre antisera which are unsuitable for use in Rh testing by the ordinary methods.

HYGIENE.

Air-Borne Fungous Spores in Manitoba.

C. H. A. WALTON AND MARGARET G. DUDLEY (*The Canadian Medical Association Journal*, December, 1945) present the results of a six-year survey of air-borne fungous spores in Winnipeg; a shorter observation was made in other localities in Manitoba. In Winnipeg data were obtained by the use of culture media and by the slide method; in other places the slide method alone was used. The authors found that the air in Winnipeg contained significant amounts of the spores of rust, smut, *Alternaria*, *Hormodendrum*, yeast and *Monilia*, and also smaller amounts of the spores of other genera including *Helminthosporium*, *Penicillium*, *Rhizopus*, *Mucor*, *Aspergillus*, *Fusarium*, *Phoma* and

Trichoderma. A seasonal incidence was observed for *Alternaria*, *Hormodendrum* and *Helminthosporium*. Although these occurred sporadically throughout the year, rust and smut occurred only in the mid-summer months. The other genera had a less pronounced season, although they were more prevalent during the warm months. Considerable variation in quantity among the fungi was noted from year to year, but the seasonal pattern remained mainly the same. In places outside Winnipeg, it was found that atmospheric spore counts varied widely in amount, but followed the same seasonal pattern as in Winnipeg. In spite of differing conditions, the general conclusion is drawn that the population of air-borne spores is similar in type throughout Manitoba, but varies in amount. The authors state that they have encountered a number of patients who are undoubtedly spore-sensitive, and that the seasonal variation in the atmospheric spore content is probably of considerable importance. In Manitoba the following should be regarded as clinically important: *Alternaria*, *Hormodendrum*, yeast, *Monilia*, rust and smuts.

Effect of Influenza Vaccination One Year Later.

JONAS E. SALK, H. E. PEARSON, P. N. BROWN, C. J. SMYTH AND T. FRANCIS, JUNIOR (*American Journal of Hygiene*, November, 1945), have studied immunization against influenza with observation during an epidemic of influenza A one year after vaccination. This work was part of the field study reported earlier, and the vaccine used was similar. Graphs showed considerable antibody rise to both A and B virus. Fifteen months later, samples of the same vaccine were used to immunize a further group of volunteers, and similar rises in antibody titre were found, although the prevaccination titres generally were higher. Paired bleedings in control subjects suggested that influenza B virus was present in the community, and in one area a small epidemic with three deaths was recorded, but the virus was not isolated, and the diagnosis rested on serological grounds only. Influenza A appeared in the community one year after vaccination, and the distribution of vaccinated subjects in observed groups was about 40%, while control groups had no vaccinated persons. It was noticeable that the incidence of clinical influenza was 21.7% in the control groups and 3.9% in the vaccinated. No claims were made that this difference was due to immunization, but the evidence of persistent antibody rise was considered to be suggestive of the fact that some protection might have been given.

The Transmission of Poliomyelitis to Rhesus Monkeys by Accidental Laboratory Infection.

H. A. HOWE AND D. BODIAN (*American Journal of Hygiene*, November, 1945), of the Poliomyelitis Research Centre, Johns Hopkins University, found that about a fortnight after a presumably normal monkey had been received, it developed a rise in temperature and paresis. Its cord was inoculated into four other monkeys who developed typical poliomyelitis. Another monkey, received as normal and free from symptoms or signs for one month, was sacrificed and its cord was passed to four other monkeys who developed the

typical disease. Three new symptomless monkeys were tested, but the injection of their cords gave negative results. Three symptomless animals two months in the laboratory were taken and their cords were injected into three others. One developed the disease, one easily tired, and one remained without symptoms. No evidence could be obtained that any of the animals had been previously used in any laboratory. From the cord pools three out of four animals inoculated intranasally developed the disease; those exposed to alimentary infection remained intact. No evidence could be found that these accidental infections spread by the alimentary route or that the virus was in the stools.

An Epidemiological Study of Encephalitis.

W. McD. HAMMON, W. C. REEVES AND P. GALINDO (*American Journal of Hygiene*, November, 1945) have made an epidemiological study of encephalitis in the San Joaquin Valley of California. In June and July, 1943, over ten thousand blood-sucking arthropods (7,700 mosquitoes) were tested for virus. Thirty-one strains of western equine encephalomyelitis virus were isolated. Twenty-eight of these came from *Culex tarsalis*, one in every 78 tested. *Aedes dorsalis*, a day biter, was isolated twice in 914 tests. Precipitation tests of the blood showed that *Culex* fed commonly (55%) on birds. *Aedes* prefers large mammals. Chicken ticks, *Argas persicus*, gave negative findings. No St. Louis virus was met with. No winter-caught mosquitoes were found infected. Twenty chickens were tested for serum antibodies to the two viruses; seven were positive for the western virus and eight for the St. Louis virus. The important vector appears to be *Culex tarsalis* for western equine type, and birds including domestic fowls are an important source.

Effect of Fatigue, Chilling and Mechanical Trauma on Resistance to Experimental Poliomyelitis.

S. O. LEVINSON, A. MILZER AND P. LEWIN (*American Journal of Hygiene*, September, 1945) have investigated the effect of fatigue, chilling and mechanical trauma on resistance to experimental poliomyelitis. They worked with Macacus monkeys, and swimming was used, the animal being put into a tank with water at 39° C. on the third, fourth and fifth days after inoculation. They swam about for two hours or so till exhausted. The controls were placed in a strait-jacket into water shallow enough for them to stand. Both suffered far more severely than cage controls, though those in the unexercised group were worse than those in the exercised group. Two groups were now tried in regard to temperature. In one-half of the cases the temperature of the water was dropped from 30° to 17° C. More than twice as many as among the controls developed severe paralysis. Only 3% escaped paralysis as against 29% in the control group. Certain muscles were bruised with a rubber hammer, but no significant difference was noted in them. Although the upper extremity was bruised in almost all, the paralysis chiefly occurred in the leg. A seasonal variation was noted, paralysis occurring more often and more severely from May to August.

British Medical Association News.

NOTICE.

THE General Secretary of the Federal Council of the British Medical Association in Australia has announced that the following medical practitioners have been released from full-time duty with His Majesty's Forces and have resumed, or will resume, civil practice as from the dates mentioned:

- Dr. C. D. Gilles, 29, Wickham Terrace, Brisbane (February 4, 1946).
 Dr. H. R. Macourt, 37, Rawson Street, Epping (April 29, 1946).
 Dr. H. M. Marks, 159, Macquarie Street, Sydney (April 15, 1946).
 Dr. J. N. Sevier, 185, Macquarie Street, Sydney (June 1, 1946).
 Dr. F. D. Smith, 48, Anson Street, Orange (May 17, 1946).
 Dr. Fergus M. Yeates, Ballow Chambers, Wickham Terrace, Brisbane (April 24, 1946).

Naval, Military and Air Force.

APPOINTMENTS.

THE undermentioned appointments, changes *et cetera* have been promulgated in the *Commonwealth of Australia Gazette*, Number 91, of May 16, 1946.

AUSTRALIAN MILITARY FORCES. Australian Army Medical Corps.

V159801 Lieutenant-Colonel (Temporary Colonel) A. E. Colvin, C.B.E., M.C., relinquishes the rank of Temporary Colonel and is placed upon the Retired List with the rank of Lieutenant-Colonel, and is granted the rank of Honorary Colonel, 21st October, 1945 (in lieu of the notification respecting this officer which appeared in *Commonwealth Gazette* No. 14 of 1946, page 209).

The date appearing in the notification respecting NX34855 Captain F. N. Street, M.C., which appeared in *Commonwealth Gazette* No. 14 of 1946, page 221, is amended to read "2nd November, 1945".

The name of NX70276 Major (Temporary Lieutenant-Colonel) W. L. Macdonald is as now shown and not as it appeared in Executive Minute No. 186 of 1945, promulgated in *Commonwealth Gazette* No. 248A of 1945.

ROYAL AUSTRALIAN AIR FORCE. Citizen Air Force: Medical Branch.

The grant of the acting rank of Squadron Leader to Flight Lieutenant O. W. Bowering (285170) is terminated upon his ceasing to occupy a Squadron Leader post with effect from the 9th November, 1945.—(Ex. Min. No. 98—Approved 16th April, 1946.)

The appointments of the following officers are terminated on demobilization with effect from the dates indicated: (Temporary Squadron Leaders) K. F. D. Sweetman (252344), 13th December, 1945, S. D. Watsford (253263), 14th December, 1945. (Temporary Wing Commander) O. W. Leitch (281889), 27th November, 1945, Temporary Flight Lieutenant J. De Vidas (282621), 12th November, 1945.

The appointment of Temporary Squadron Leader W. P. McLaughlin (261770) is terminated on demobilization with effect from the 7th December, 1945.

The appointments of the following Temporary Squadron Leaders are terminated on demobilization with effect from the dates indicated: B. J. Mulvany (251258), 22nd January, 1946, A. H. Campbell (253730), 14th February, 1946.—(Ex. Min. No. 107—Approved 16th April, 1946.)

The appointment of Temporary Squadron Leader K. J. Basedow (283342) is terminated on demobilization with effect from 17th December, 1945.

The appointment of Temporary Flight Lieutenant S. R. Peters (266319) is terminated on demobilization with effect from 29th November, 1945.

The appointments of the following officers are terminated on demobilization with effect from the dates indicated: (Temporary Wing Commanders) K. E. Rex (251245), 18th January, 1946, H. D. Phipps (251243), 22nd January, 1946, Temporary Squadron Leader, Acting Wing Commander, J. K. Gabriel (252085), 12th February, 1946, Temporary Squadron Leader G. C. Wilson (251265), 18th January, 1946, (Flight Lieutenants) J. P. Walsh (257477), 15th January, 1946,

J. R. V. Foxton (255254), 16th January, 1946, Temporary Squadron Leader R. G. Tonkin (251659), 10th January, 1946, Flight Lieutenant, Acting Squadron Leader, H. Hoban (254852), 11th January, 1946, (Temporary Squadron Leaders) F. G. Favaloro (253718), 11th December, 1945, L. L. O. Bevan (252860), 18th December, 1945, H. L. Catchlove (251419), 20th December, 1945, F. J. B. Drake (252835), 21st December, 1945, (Temporary Flight Lieutenants) E. W. Pryde (257581), 3rd December, 1945, C. H. Chambers (254904), 13th December, 1945.

The appointment of Flight Lieutenant C. H. Noack (285904) is terminated on demobilization with effect from the 18th January, 1946.

The appointment of Temporary Squadron Leader G. C. Corlis (262866) is terminated on demobilization with effect from the 17th January, 1946.

The grant of the acting rank of Group Captain to Temporary Wing Commander W. McL. Borland (251477) is terminated upon his ceasing to occupy a Group Captain post with effect from the 18th February, 1946.

CASUALTIES.

ACCORDING to the casualty lists received on May 10, 1946, Major J. F. Akerooyd, of Frankston, Victoria, has been removed from the "seriously ill" list.

Correspondence.

RESEARCH AT THE KANEMATSU INSTITUTE.

SIR: I hand you herewith a statement by the board of directors of Sydney Hospital as a reply to recent publicity in THE MEDICAL JOURNAL OF AUSTRALIA concerning the temporary suspension of the activities of the Kanematsu Research Institute at this hospital.

The directors would be pleased if you would publish this in the Medical Journal.

Yours, etc.,

A. F. BURRETT, Secretary.

Sydney Hospital,
May 21, 1946.

STATEMENT BY THE DIRECTORS OF SYDNEY HOSPITAL.

The Kanematsu Memorial Institute of Pathology was opened in April, 1933, as a routine department of the hospital at a cost of £29,000, with an original gift of £25,000 from F. Kanematsu (Aust.) Ltd.

The research section was inaugurated by the hospital board in July, 1937, and was temporarily closed by the board from the 1st April, 1946. This was due to two factors:

(a) Withdrawal of the subsidy by the Hospitals Commission and its refusal to approve of any appointment of a director of research, except on a temporary basis. Dr. Eccles's appointment was for a seven years term, and the board was advised that it would be impossible to induce any suitable research worker to accept an appointment unless on a reasonably long term basis.

(b) Disintegration of the department, not from without but from within. Assisting Dr. Eccles in his work were Dr. Katz and Dr. Kuffler. Of these, Dr. Katz was granted leave in 1942 for service with the Air Force, with which he remained until November, 1945. He left in January, 1946, for London to take up a position as assistant director at a new institute at University College, London. Dr. Eccles left in 1944 to become Professor of Physiology at Otago University. Dr. Kuffler left in November, 1945, to accept a research fellowship at the University of Chicago.

In 1941, Mr. R. N. Lyons was appointed a full-time worker to investigate the bio-chemistry of the maturation process in blood serum preparation and was the only member of Dr. Eccles's team left when the Department was temporarily closed in April, 1946.

Dr. Eccles called the meetings of the Advisory Subcommittee when he saw fit and brought before it matters that he desired for discussion. A study of the minutes of the Kanematsu Advisory Subcommittee, which for some time was comprised of Sir Norman Paul (chairman) and Mr. S. S. Blake (Sydney Hospital board members), Professor H. K. Ward and Professor Keith Inglis (elected members), and Dr. Harold Ritchie and Dr. George Bell (representatives

of the honorary medical staff of Sydney Hospital), shows clearly that the Sub-committee cooperated with Dr. Eccles to the fullest extent by agreeing to his recommendations, both as regards staff appointments and the type of research investigations. In turn, the board agreed to such recommendations almost invariably without alteration, and any variation by the board was only minor and made in a spirit of cooperation. There is not one instance of recorded friction or any hint of dissatisfaction on Dr. Eccles's part. That the members of the board on this committee were interested in research is shown by the attendances of Sir Norman Paul (19) and Mr. Blake (16) during the past 20 meetings since 9th December, 1941.

Dr. Eccles advocated the principle of putting aside as much of surplus income as possible into an endowment fund. He urged that an institute without funds and an assured income to provide salaries and working expenses would not attract a staff of any note, as security of tenure would be lacking, and this policy was approved by the Advisory Committee, and in accordance therewith the board accumulated £8,000 and created an endowment fund in that sum in 1941.

In 1936 an annual special grant of £4,000 for research expenditure was approved by the State Government and payable through the Hospitals Commission. It was this grant that enabled the hospital to finance the research section of the institute, and it remained the institute's source of regular income, apart from special temporary grants for salaries from the National Health and Medical Research Council, and £2,500 for the Noise and Acoustic Testing Laboratory.

In February, 1937, Lord Nuffield made a gift of £4,000 to Sydney Hospital, which, with the donor's concurrence, was allocated as a permanent endowment fund for the Kanematsu research, and subsequently the State Government gave a special grant of £4,000 to supplement Lord Nuffield's gift, making £8,000 in all, the interest only from this fund to be used. In addition the board had the £8,000 funded as previously mentioned.

The board is convinced that a substantial endowment fund is essential for the institute. The Hospitals Commission has been aware of these endowments in granting its subsidy since 1941. These endowments have been clearly shown in annual balance sheets submitted to the Hospitals Commission.

In December, 1944, the board had £2,550 accumulated funds invested in Commonwealth stock other than the above endowment funds. The £4,000 grant continued to be credited in monthly instalments to the hospital's banking account, until the 30th June, 1945. In May of that year the Commission requested a financial statement of the institute for the eleven months of the then current financial year. This showed an excess of expenditure over income of £351, endowment funds £16,000, and cash in hand and Commonwealth stock £3,064. In its final letter to the Commission, asking for authority to advertise for a research director for a seven years' appointment, the board did not refuse to use any of its funds towards this, and has in fact been using them, except endowment funds. Since 1st July, 1945, £2,700 of the £3,064 accumulations have been used.

If staff were available, and assuming that the principal of the endowment fund of £8,000, created by the board, was resorted to for general expenses, this amount would suffice for about 18 months only.

Representatives of the board had two deputations to the Minister for Health in regard to the continuance of the subsidy for the research department, which was not granted. The following correspondence is material:

10th January, 1946—from Hospitals Commission to Sydney Hospital.

Further to previous correspondence in connection with the subsidy in respect of the Kanematsu Research Institute and referring particularly to the deputation to the Minister on the 19th ultimo, I have to inform you that the Commission has given further consideration to the request that the hospital should be allowed to retain the accumulated funds as a reserve and that the former subsidy should be restored.

After the fullest consideration of the matter, the Commission regrets that it cannot approve of the restoration of the subsidy until such time as the accumulated funds are used up.

The Commission is also of the opinion that the whole problem of medical research in this State should be investigated, and to this end proposes to set up a medical research investigation committee as a preliminary step.

I am also directed to add that if the hospital has in mind the making of any appointment to the staff of

the institute which in its opinion would necessitate entering into a long term contract with the appointee, the Commission desires that any such proposal should be submitted to it and its approval secured prior to the hospital entering into any commitment in regard to the matter.

26th January, 1946—from Secretary of Sydney Hospital to Minister for Health and Hospitals Commission.

Referring to the Hospitals Commission's letter of the 10th instant (No. H44/419/1437) in connection with the restoration of the subsidy of the Kanematsu Institute, and particularly to the last paragraph of that letter concerning the possibility of advertising new appointments there, this matter has now been considered by the board of directors, and I have been instructed to make the following application to you and to the Hospitals Commission.

Sydney Hospital desires to advertise for a director of research at the Kanematsu Institute at a salary of £1,750-£2,000 p.a. for a term of seven years, and before commitment seeks your approval, in terms of the Hospitals Commission's letter, dated 10th January, 1946.

The previous director of the Kanematsu Institute, Dr. J. C. Eccles, resigned in January, 1944, to accept an appointment in New Zealand. Since then Dr. A. J. Canny has been acting director, and his appointment expires in March next.

I have been requested by the directors to ask if you would be kind enough to consider this application as quickly as possible, so that definite arrangements may be made in the near future.

21st February, 1946—from Hospitals Commission to Sydney Hospital.

With reference to your communication of the 26th ultimo in relation to the proposed appointment of a Director of Research at the Kanematsu Institute for a period of seven years, I am directed to inform you that the Commission is not prepared to approve of the proposal, as it is the view of the Commission that the time has arrived for the coordination and control of research activities, and the Commission is conferring with the Minister with a view to arriving at a scheme which will give the result desired by the Commission.

For this reason the Commission is not prepared to approve of the board's proposal for the appointment of a director as proposed by the hospital, and any appointment should necessarily be on a temporary basis.

If the Hospitals Commission were to allow the board to appoint a director for some reasonable term, with an assurance that funds will be available, the board would reopen the department, and is anxious to do so.

Yours, etc.,

A. F. BURRETT,
Secretary, Sydney Hospital.

17th May, 1946.

SIR: The cessation of medical research at the Kanematsu Institute of Sydney Hospital is, as you state in your leading article of May 4, indeed a calamity. It has caused a feeling of apprehension and dismay in the ranks of research workers as well as of the profession in general. Quite apart from the duty of any hospital to contribute to the progress of medical knowledge, the association of research and routine work under one roof is essential to the progressive raising of the standard of routine pathological work.

In the Institute of Medical Research at the Royal North Shore Hospital, research has prospered and new methods of clinical estimations are constantly developed, because capable research workers are in control of each department of the institute. This has encouraged an inquiring mind in the routine worker and led to the development of new methods.

The Board of Directors of the Royal North Shore Hospital has always encouraged research, and, largely because of this, the work of the institute has been recognized widely beyond the borders of Australia; in fact, more perhaps than in Australia itself. The fundamental research work of Dr. Lemberg, the head of the biochemistry department, is widely known, both in England and the United States, and there is a constant exchange of ideas with important research centres overseas.

The main disaster in the closing of the Kanematsu Research Institute is the dispersal of trained research workers. The supply of these men in Australia—or rather of those willing to stay in Australia under the conditions offered them—is very small indeed, and the action of the Board of Directors of Sydney Hospital definitely discourages

men who may be able to do first-class research work from entering such an unpromising and uncertain field.

Yours, etc.,

W. W. INGRAM,
Director.

Institute of Medical Research,
The Royal North Shore Hospital,
Sydney.
May 14, 1946.

MALARIA.

SIR: The matter of absence from work on account of illness was serious during the war years, and it was hoped that it would improve after hostilities ceased, but this hope has not been realized.

The return to civil life of servicemen, many of whom have been in a "malarial" area and may have had malaria, has brought into the community many who may at any time have an attack of malaria. Many ex-servicemen have also what may be called a "malaria neurosis" and consider they are quite competent to diagnose their own complaint.

The Repatriation Department has, we understand, circulated to its local medical officers a standard method of treatment and has asked that blood smears be taken to establish the diagnosis. It would greatly facilitate the work of industrial organizations in dealing with absences if these instructions were carried out, not only by the repatriation local medical officers, but by all who are called upon to attend ex-servicemen.

At present many certificates are issued on what would appear to be insufficient evidence, and in many cases recommending leave for long periods. If the diagnosis is clinched by the methods suggested by the Repatriation Department, true malarial cases can be put under suitable treatment and malaria can be excluded from diagnosis in questionable cases, saving a considerable amount of future worry and lost time.

Yours, etc.,

M. R. FINLAYSON,
Chief Medical Officer, New South Wales
Government Railways.
J. McF. ROSSELL,
Chief Medical Officer, Department of
Road Transport and Tramways, New
South Wales.

Sydney,
March 2, 1946.

POLITICS AND THE MEDICAL PROFESSION.

SIR: I must apologize for not having replied sooner to Dr. Dark's letter in the journal of April 13, 1946. Being out of town is responsible for the delay.

I am glad that Dr. Dark offered some comments on my letter (THE MEDICAL JOURNAL OF AUSTRALIA, March 23, 1946), as it affords me a further opportunity of exposing the curious method of exposition (I cannot say reasoning) so beloved by the socialist mind.

Let me remind your readers that Dr. O'Day gave them a definition of socialism. He said: "Socialism is a political economy in which the means of production, including the land, are held collectively." Further on Dr. O'Day stated: "And payment is made according to quantity and quality of work done."

I endeavoured to point out that this was a contradiction, in that socialism or the collective ownership of the means of production, including the land, could only be established and continued under a system of equal rewards, not unequal rewards, as obtains in Russia.

Now let us return to Dr. Dark. He states: "But it is obvious that on a collective farm, for example, it would probably be sensible to give the manager a larger share of the product than the stable boy—it would still be a collective."

Let your readers first remark that Dr. Dark does not categorically deny that socialism means equality of reward, and secondly, he uses that vague "sit on the fence" term—probably.

I am not in the habit of quoting authorities in friendly controversy, especially socialist authorities, as the socialist has always a comeback by stating, "Oh, he is not a socialist—he is this or that", the truth being that there are so many different brands of socialism that an assertion such as that might be true. But, let us see what the "Encyclopædia Britannica", latest edition, in the article socialism states *inter alia*: "not until the two main tenets of socialism, abolition of private property . . . and equality of income, have taken

hold of the people as a religious dogma, as to which no controversy is regarded as sane, will a stable socialist State be possible."

Further, another authority, G. B. Shaw, a socialist of over fifty years, affirms in his book, "The Intelligent Woman's Guide to Socialism, etc.": "The only way out of this difficulty is to give everybody the same, which is the socialist solution of the distribution problem. Socialism means equality of income and nothing else. Who ever has not reached this conclusion (equality of income) is no socialist."

I could quote further authorities, but it is unnecessary, as anyone can reason the correct conclusion from the theories of socialism, collectivism or communism.

Dr. Dark then goes on to himself supply one of the mystic pomposities so dear to the mind of the socialist, and which he left to his fellow communist, Dr. O'Day, to explain. He asserts that the great cry of the socialist, so prominent a few years ago, and now dropped, "from each according to his ability, to each according to his means", could only be thought of by an incredible fool until two conditions in society have been fulfilled. Well the first of his conditions has been fulfilled in several countries, but not in Russia, and the second is a mystic pomposity that might be applicable in a society of angels, but not otherwise.

I assert again that communism and fascism are essentially the same. They may differ in their attitude to trade unions, to mothers' clubs and other trifling details, but they are both founded on the same basic principle, that is, a negation of the people's freedom, the rule by a small bureaucracy by methods of force and violence and the secret police. Bertrand Russell asserts it, G. Salvemini asserts it, an examination of the facts proves it. Dr. Dark finally is again unfortunate in his attempt to discredit my assertion that the birth of communism had no analogy with obstetrical practices.

The surgical procedures that he describes, such as performed with cranioclasts *et cetera*, are only done after grave consideration and with a view of saving life, not destroying it—the mutilation of a fetus is only done when the possibility of delivering alive is problematical and the death of the mother likely. The birth of communism is to be brought about by the extermination of its opponents in a bloody holocaust as was done in Russia.

I rather fancy I know more about socialism or communism than does Dr. Dark. If I were so much devoted to this system of autocracy and violence, I would seek entry into the country where its adherents allege freedom and prosperity abound. But where, as Mr. White states, "there is no garbage".

Yours, etc.,

111, Collins Street,
Melbourne, C.I.,
May 1, 1946.

PAUL G. DANE.

ORGANIZATION OF A PROFESSION.

SIR: At the recent meeting of the Federal Council, Dr. A. E. Lee made reference to the fact that I had urged the Council of the Queensland Branch to press for the formation of a representative body.

As a result of experience gained as a member I formed the opinion that the Federal Council would not fully achieve its objective until such time as a representative body became part of its machinery. Perusal of the report of the recent meeting of the Federal Council serves to strengthen that opinion. Sir Henry Newland is reported to have said that after twenty years as president, "he was impressed by the futility of a great deal that the Federal Council did".

While the Council does much useful and necessary work for which they do not get very much recognition, I agree with Sir Henry that much time of the Council is taken up with very little effect. I think, however, that the urge should come from below, as if members of the Association, however distant from the centre of things, felt that they had some part in forming policy on matters of Australia-wide medico-political interest, members of the Federal Council would receive more backing than they do at present.

To my mind the chief reason for the present state of affairs is failure to implement fully object 3 (g) of the Memorandum of Association of the Federal Council, namely, this object is "to form a bond of union among representative branches and a medium through which their opinions can easily be ascertained or expressed".

It is not to be wondered that the President appears to experience a sense of frustration. Exercise of the executive function of the Council would be sufficiently difficult, even if it were fully informed as to the wishes of the members in Australia on policy.

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The Queensland Branch Council appears to think that a representative body would be too costly, but such opinion appears to me to be not well founded. A representative body could consist of some seventy odd members, one to be elected for each of the areas corresponding to the Federal Electoral Divisions by members of the Branches residing in the respective areas. The normal times of meeting of the representative body should be at congress, which might be every two years, which interval between congresses has been suggested as desirable in the past on a number of occasions.

The cost of the meeting of the representative body held at congress time should be very little, as members attending congress could be found willing to undertake the duty of acting as representatives for the respective divisions. Emergency meetings would occur rarely, and in such event the cost of sending seventy representatives to a meeting should not be beyond the capacity of some 6,000 or more members.

May I say, in conclusion, that I agree with those who do not wish to weaken our ties with the Parent Body and hope no action will be taken in such matter without a referendum of members in Australia.

Yours, etc.,

E. S. MEYERS.

The Medical School,
Herston,
Brisbane.
May 13, 1946.

AMICROBIC PYURIA.

SIR: My interest was aroused by the case of amicrobic pyuria reported by R. S. Lawson in your journal of April 20, and surprise that this was the first case reported in Australia prompted this letter. I spent some five months looking after a urological ward in an army base hospital, during which time I can recall at least three cases regarded as abacterial or amicrobic pyuria. The impression gained from the consultant to the ward (Major R. J. Silvertown) was that the condition was common enough—amongst a service personnel anyway. During the same period no case of genito-urinary tuberculosis was admitted and only one case in nine months.

Two of the cases were similar to the case reported, although the clinical picture was less severe. One case had been admitted initially with urethritis to a special hospital, and both had run the usual gamut of chemotherapy. A search was not made for the tubercle bacillus, and the dramatic relief given by 0.3 grammes of "N.A.B." bi-weekly for three weeks confirmed the diagnosis.

The third case was very much more severe, the patient being reduced to a state of querulous invalidism. Cystoscopy revealed a murky urine (like examining the urine in sulphonamide anuria), a very "dirty" bladder, of small capacity, and pyelogram showed irregular, tortuous, widely dilated ureters, pelvis, calyces, of both sides, suggesting obstruction where the ureters ran through the bladder wall. The usual course of "N.A.B." was given with great relief of symptoms and the urine almost cleared (ten to twenty pus cells per high dry field). Unfortunately after several weeks relapse occurred, the patient was transferred to his home State, and further progress could not be watched. Search for tubercle bacilli was negative incidentally. Of interest is the frequent association of urethritis, and the fact that many cases of "non-specific urethritis" (after exclusion of local causes by panendoscopy) clear up just as dramatically with arsenicals might suggest an association between the two conditions.

I hope the interesting account given by R. S. Lawson will bring forth further reports of this distressing condition.

Yours, etc.,

IAN MONK,
Major, Australian Army
Medical Corps.

Melbourne,
April 22, 1946.

OBSERVATIONS ON PSYCHOSES OCCURRING IN SERVICE PERSONNEL IN FORWARD AREAS.

SIR: Major H. J. B. Stephens, in his article in THE MEDICAL JOURNAL OF AUSTRALIA, February 2, 1946, raises some interesting points about psychoses occurring in service personnel. He mentions particularly the treatment of acute confusional psychosis and is confident about the results of electro-convulsive therapy in this condition.

In my opinion we should be very conservative about recommending this form of treatment, especially as most

cases of acute confusion do well with efficient sedation and due care of their physical condition. Although Major Stephens points out that there is little danger of intellectual deterioration from a short course of electro-convulsive therapy, I think it is better avoided, especially if the patient's occupation demands a high standard of intellectual performance. Insulin treatment is of benefit in some cases.

I think all will agree entirely with his suggestion that considerable care should be taken before affixing a diagnostic label to a patient's mental state. Acute confusional psychosis is a very different condition from schizophrenia, though the differential diagnosis may at times be difficult. I am afraid that quite a number who have really suffered an attack of acute confusion and have a very good chance of going through life without another attack will suffer the social consequences of having been carelessly labelled schizophrenic. We have not yet reached the happy stage when society looks upon schizophrenia with the same tolerance as it does, for instance, upon *diabetes mellitus*.

Yours, etc.,

F. W. GRAHAM.

111, Collins Street,
Melbourne, C.I.,
April 22, 1946.

SERVICES MEDICAL OFFICERS' ASSOCIATION OF NEW SOUTH WALES.

SIR: At a meeting held in the Stawell Hall of the Royal Australasian College of Physicians on May 1 it was decided to form a Services Medical Officers' Association of New South Wales, membership to include medical officers who have served or are serving in the armed forces of the British Empire in the 1914-1918 or 1939-1945 wars.

The objects of the Association are: (a) to promote the welfare of dependants of medical officers who were disabled or are deceased as a result of war service; (b) to maintain the bonds of comradeship formed on war service; (c) to promote the welfare of members.

The following office bearers were elected: *President*, Dr. H. R. G. Poate; *Vice-Presidents*, Dr. C. P. Ley, Dr. F. A. Maguire and Dr. S. E. L. Stening; *Honorary Treasurer*, Dr. L. S. Loewenthal; *Honorary Secretary*, Dr. J. M. Yeates; *Committee*, Dr. J. Cobley, Dr. F. F. Ellis, Dr. W. Freeborn, Dr. E. Goulston, Dr. R. V. Graham, Dr. C. P. Hudson, Dr. J. Isbister, Dr. R. A. Money, Dr. A. W. Morrow, Dr. C. P. Reilly and Dr. D. A. Warden.

Further details and application forms for membership (annual subscription is ten shillings) may be obtained from the Honorary Treasurer (Dr. L. S. Loewenthal, 217, Macquarie Street) or the Honorary Secretary (Dr. J. M. Yeates, 135, Macquarie Street).

Yours, etc.,

J. M. YEATES.

Sydney,
May 6, 1946.

THE BASIC WAGE, SHORTAGE OF NURSES AND SOCIAL MEDICINE.

SIR: If Dr. Meyers' suggestion (THE MEDICAL JOURNAL OF AUSTRALIA, April 20, 1946) of a basic wage for every person (not for every family, but for every member of every family) were adopted, the most important economic, social, medical and moral effects would follow. A basic wage for every person is tantamount to rationing money. We have rationed goods to every person: our coupons pass to the retailer; from him they pass on to show his right to restock his shelves; they are then destroyed. If money were rationed and cancelled when spent, there could be no interception of currency by the financier (an interception which gives him control of our lives and our labour!) and we would be free of debt. If money were rationed—if each of us had a basic wage—there could be no black markets, all work would become vocational and each would be valued for the work he did, and the efficiency and spirit with which he did it, the large family would become an advantage to parents, the temptation to contraception and abortion would largely disappear, all would be well fed. We would each be free and secure, not only against would-be dictatorial governments, but also against family dictatorship. There would be the so-desired equality of opportunity, and the gradual disappearance of the irksome sense of status. We could practise our religion.

Medicines, hospitals, medical, surgical, nursing and dental treatment would all be free to the patient, yet without loss of freedom to either patient or attendant. The commercial taint in the professions would go.

As health is largely a matter of diet, and of a sense of security, and of (religious) outlook on life, we would become an extraordinarily healthy nation.

Such a practice as rationing money would appeal to our good side, not to our greed and our fear, our frustration and selfishness, as does the existing debt and profit system under which we live now. Both the Christian and Freudian recognize that each of us has both a good and a bad side. We should discard the evil system and replace it by the good, and so develop our good rather than our bad side.

It is possible to introduce a basic wage in Australia—the whole theory has been worked out and published. Doctors should demand that a royal commission be appointed to investigate its practicability.

Yours, etc.,

MARY C. DE GARIS.

Geelong,
Victoria.

April 30, 1946.

The Royal Australasian College of Surgeons.

GEORGE ADLINGTON SYME SCHOLARSHIP, 1946.

THE Council of the Royal Australasian College of Surgeons invites applications for the George Adlington Syme Research Scholarship for 1946. The scholarship is valued at £50. Applicants are requested to give full details of the research work which they desire to undertake. It is preferable that the research should be clinical in nature. The successful applicant must undertake to publish in *The Australian and New Zealand Journal of Surgery* a paper recording the result of his or her work, should the Council so desire. Any further information required may be obtained from the Secretary of the College, Spring Street, Melbourne, C.1, with whom applications must be lodged on or before July 31, 1946.

Obituary.

GEORGE MURRAY ANDERSON.

We are indebted to Dr. W. E. L. H. Crowther for the following appreciation of the late Dr. George Murray Anderson.

On April 16 of this year Dr. George Murray Anderson died at Hobart of uræmia. He had been my friend since commencing practice at Hobart, and my patient for some twenty years, and especially through his last long illness.

Born at Circular Head (Stanley), north-west Tasmania, on October 25, 1866, he was the youngest but one of the family of nine children of George Anderson, who at the time was teacher to the little settlement while developing his farm some miles deeper in the country. George Anderson, the elder, had come to Van Diemen's Land in 1835 from Boyndie, Scotland, as a tutor and teacher. He was a member of the staff of Hawkes School, Perth Village, and the Longford Academy before assuming the small school (of only some seven children) at Circular Head. In 1851 he left his desk and went to the diggings, the Turon Valley, first via Sydney, whence after small success he set forth to Australia Felix. The move brought a small degree of reward and more disappointments, and eventually he found his way back to the new farm on our north-west coast which he named "Boyndie". Here were reared seven of the nine children born to his wife. Here, too, it is worth noting one of his close friends was that gifted prospector, "Philosopher" Smith, who put his theories into practice by the discovery of immense tin deposits of Mount Bischoff and opened a new era for Tasmania.

The two younger children, George and Bruce, were both inclined to medicine, and entered the University of Aberdeen. George was educated at Stanley and later at the Church Grammar School, Launceston. It is very possible that, like G. B. Shaw, he might have said that he acquired the essential part of his education from the conversation of his father and the artistic tastes of his mother. Having graduated M.B., C.M. of Aberdeen in 1890, he practised for three years at Lerwick, Aberdeen, Inverness, Forfar and Murthly Asylum. He has told me that the experience he most valued was his association as assistant to an able general practitioner (I think in the Inverness period), who had a

very large obstetric practice, which in effect he handed over to young Anderson.

Back in Tasmania in 1893, he decided to settle at Franklin. At that time it was a little centre of fruit-growers, and I remember it well about five years later, having spent a long holiday there with my uncle, who was its stipendiary magistrate. The little village lay between the Huon River and the steep hills behind. It had really only one street, well over a mile in length, and was situated about half-way between Huonville and Geeveston. Although extremely heavily timbered when first selected by Sir John and Lady Franklin, at this time it was producing excellent apples and small fruits. Communications were by river steamer, one good main road (with a daily coach with four horses to and from Hobart), and for the rest narrow country roads. For the first twelve to fifteen years all his visiting was done by riding or driving or by row boat across the river, to be met on the other side by some conveyance to drive him to his patient. In this manner, single-handed, he managed a most difficult practice. My first contact with him was about 1912, when a junior resident at the old Hobart General Hospital. It was his practice to go away from time to time at the week-end for swan or duck shooting or with the local team to visit another country centre for a rifle match. On such occasions I was asked to look after his work. Later when in practice myself I did this for longer periods, as when he had one of his periodical attacks of renal calculus. By this time, however, he had a "Fiat" car which was a great novelty and which allowed me to see much country that was new. At night, too, I had to take to the boat well down the stream, and, crossing the river, meet a local lad with some kind of a conveyance to take me to my destination. It was his custom also at the end of the day to dispense the necessary medicines in his own small dispensary.

In himself he was a typical Scot. Reticent until he knew one and very sparing of words. I have been with him to a patient and realized, when we were driving home, that, apart from a few words of greeting and his final instructions to his patient or their relations, which were always clear and explicit, he had hardly spoken. He was in the habit of listening very carefully to what his patient could tell him, asking an occasional brief question. Once he had come to a decision as to the diagnosis, he acted promptly and had no further doubts. And he was one of the best diagnosticians I have known. With the passing of the years he became a really first-class practitioner, who knew his limits and was afraid of nothing. It is not surprising therefore that he had the trust and respect of all his huge district and the deep affection of his patients.

One experience, shared with him, was unforgettable. A message had come that a young married woman had been thrown from a chaise cart and seriously injured. Dr. Anderson asked me if I cared to come with him, and we arrived at a small cottage half-way between Longley and Hobart about eight in the evening. His patient was lying in bed, profoundly collapsed, her pulse rapid and almost imperceptible and with all the signs of advanced internal hæmorrhage. Examination of the abdomen indicated a ruptured viscus, almost certainly the spleen. Dr. Anderson with his grave courtesy asked what I thought should be done. This was, of course, before the days of the motor ambulance, but my reply was that she should be sent by some vehicle to Hobart for surgical treatment. He thought for a while and then said: "I can't agree with you; if that is done she will certainly die; she must be treated in her home." He then went to his bag and counted out some opium pills. One was given her at once and instructions given to a female relative for the others to be given at stated intervals; also that she was to have complete quiet and rest and as much water as she could take in small quantities at frequent intervals. The hæmorrhage ceased; next day she was much better, and she made a complete recovery in her own home. What I have written gives some indication of his courage and ability and readiness to accept the gravest responsibilities. As is the case in a country practice, he had periods of comparative inactivity, when he read widely from textbooks and journals. He weighed and remembered what he had read and was eager to embody such ideas as convinced him into his daily work. Again he was for many years a loyal member of the Tasmanian Branch of the British Medical Association, although he was unable to attend the meetings.

The last years at Franklin were saddened by the continued ill health of Mrs. Anderson, and in 1922 he came to Hobart, where, except for treating old patients who came to town to consult him and occasional visits to the Huon in consultation with his successor, he retired from active

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practice. This seen in retrospect was a grave mistake, as his own health deteriorated, and he must have greatly missed his work and the life of the community with which he had identified himself for so many years.

As an active member of the Royal Australian Ornithologists' Union, he found solace with expeditions to the bush and observation of birds and other native fauna. With his brother Bruce he attended some of the annual camps of the members on the mainland.

In his last years he was most tenderly looked after by his sister Miss Agnes Anderson, and in the last illness it was to her that he turned and to Miss Greenlaw, who for years had nursed his patients at the Huon.

His two sons survive him—Noel, the elder, in North Queensland, and Douglas, who is Lecturer in Economics at University College, Canberra.

Post-Graduate Work.

COURSES IN ADVANCED MEDICINE AT SYDNEY.

THE New South Wales Post-Graduate Committee in Medicine desires to announce that a course in advanced medicine will be conducted for a period of twelve weeks from June 3 to August 24, 1946, the fee for which will be £31 10s. The programme has been arranged to take place exclusively in the afternoons, from approximately 2 to 5 o'clock p.m., on five to six days per week and will include the following: (i) Four demonstrations in electrocardiography (normal cardiogram, coronary disease, the arrhythmias, deficiency diseases and infections). (ii) Ward rounds at the principal metropolitan hospitals, held approximately twice per week and including demonstrations of cardio-vascular, nervous and chest diseases *et cetera*. (iii) Library seminars at which recent literature on set subjects will be discussed. (iv) Set lectures on the more obscure medical, biochemical, physiological and pathological problems. (v) Demonstrations of the *fundus oculi*. (vi) Demonstrations of pathology and haematology in the pathological departments of the metropolitan hospitals. (vii) Discussions on applied physiology. (viii) Demonstrations of the application of radiological methods of diagnosis to medical diseases. (ix) Demonstrations of psychiatric cases at Broughton Hall. (x) The exhibition of selected medical films. (xi) Portions of the annual post-graduate course of interest to students in advanced medicine (lectures given by practitioners recently returned from overseas).

It is expected that students will devote the whole of their time to study, and for this reason the mornings have been set aside for reading. Opportunity should be taken to peruse all the recent medical literature, and students will be guided in their reading by the supervisor of the course, Dr. S. G. Nelson.

It is essential that candidates intending to take this course should make final arrangements with the committee at the earliest possible date. Those who are desirous of enrolling, but who cannot devote full time to study, should submit details of the time available to them to the committee for consideration.

Nominations and Elections.

THE undermentioned has applied for election as a member of the New South Wales Branch of the British Medical Association:

Hume, Ian Hamilton, M.B., B.S., 1945 (Univ. Sydney), 26, Woonona Avenue, Wahroonga.

The undermentioned has applied for election as a member of the South Australian Branch of the British Medical Association:

Jarvis, Barry, M.B., B.S., 1938 (Univ. Sydney), Cleve.

The undermentioned have been elected members of the New South Wales Branch of the British Medical Association:

Balkany, Andrew Francis, M.D., 1927 (Budapest), M.B., B.S., 1946 (Univ. Sydney), 143, Bellevue Road, Bellevue Hill.

Courtenay, Kevin Hector, M.B., B.S., 1945 (Univ. Sydney), 33, William Street, Double Bay.

Delohery, Henry James, M.B., B.S., 1939 (Univ. Sydney), 52, Woolwich Road, Hunter's Hill.

Desalis, Eric James Fane, M.B., 1942 (Univ. Sydney), 101 A.G.H., Punchbowl.

Farrar, Frank Martindale, junior, M.B., B.S., 1945 (Univ. Sydney), Sydney Hospital, Sydney.

Fliehle, Ian, M.B., B.S., 1941 (Univ. Sydney), 10, Herbert Street, Manly.

Frost, Thomas James, M.B., B.S., 1945 (Univ. Sydney), 28, Fern Street, Randwick.

Gilles, Nancy Catherine, M.B., B.S., 1945 (Univ. Sydney), 24, Albermarle Avenue, Rose Bay.

Grant, John Macdonald Falconar, M.B., B.S., 1945 (Univ. Sydney), Royal Prince Alfred Hospital, Camperdown.

Grunseit, Ferry, M.B., B.S., 1945 (Univ. Sydney), 17, Miller Road, Old Guildford.

Heffernan, Edward Charles, M.B., B.S., 1936 (Univ. Sydney), 149, Macquarie Street, Sydney.

Hunt, Thelma May, M.B., B.S., 1945 (Univ. Sydney), 716, New Canterbury Road, Hurlstone Park.

Karmalsky, Hillary, M.B., B.S., 1946, provisional registration (Univ. Sydney), Adelong, New South Wales.

Lloyd-Jones, Raymond, M.B., B.S., 1939 (Univ. Sydney), 19, Underwood Street, Corral, New South Wales.

Marsden, Ernest Ambrose, M.B., B.S., 1934 (Univ. Sydney), Royal Prince Alfred Hospital, Camperdown.

Moss, John Timothy St. Leger, M.B., 1945 (Univ. Sydney), 189, Homer Street, Earlwood.

Spencer, Herbert Cyril, M.B., B.S., 1938 (Univ. Sydney), 61, Ashley Street, Chatswood.

Stanton-Cook, Peter Alan, M.B., B.S., 1945 (Univ. Sydney), 9, Coolawin Road, Northbridge.

Tiernan, Justin Michael, M.B., B.S., 1944 (Univ. Sydney), 19, Monmouth Street, Randwick.

Wherrett, Charles Ronald, M.B., B.S., 1943 (Univ. Sydney), Sutherland Avenue, Ryde.

Yates, Tom Owen Richard, M.B., B.S., 1945 (Univ. Sydney), 284, Burwood Road, Burwood.

Yuille, Archibald Binnie, M.B., B.S., 1942 (Univ. Sydney), Barrenjoey Road, Newport Beach.

The undermentioned have been elected as members of the South Australian Branch of the British Medical Association:

Gibson, Douglas Barr, M.B., B.S., 1945 (Univ. Adelaide), 42, Nottage Terrace, Medindie.

Motteram, Reginald, M.B., B.S., 1939 (Univ. Adelaide), 28, Avenue Street, Millswood.

Winter, Karl Berthold, M.B., 1924 (Berlin), M.B., B.S., 1943 (Univ. Adelaide), 6, Park Avenue, Hyde Park.

Hardy, John Evans Simpson, M.B., B.S., 1945 (Univ. Adelaide), 11, Dulwich Avenue, Dulwich.

Books Received.

"Tables of Representative Values of Foods Commonly Used in Tropical Countries", by B. S. Platt; Medical Research Council of the Privy Council, Special Report Series Number 253; 1945. London: His Majesty's Stationery Office. 9½" x 6", pp. 41. Price: 9d. net.

"Handbook on Infectious Diseases with Notes on Prophylaxis, Serum Treatment and Vaccination", by the Staff of the Cantacuzène Institute, under the direction of Professors C. Ionescu-Mihăilescu and M. Ciucă; 1945. Series of League of Nations Publication, III. Health, 1945. III. 1. Geneva: League of Nations. 6" x 4½", pp. 331.

"Textbook of Medical Treatment", by various authors, edited by D. M. Dunlop, B.A. (Oxon), M.D., F.R.C.P. (Edinburgh), M.R.C.P. (London), L. S. P. Davidson, B.A. (Cambridge), M.D., F.R.C.P. (Edinburgh), F.R.C.P. (London), J. W. McNee, D.S.O., D.Sc., M.D. (Glasgow), F.R.C.P. (Edinburgh), F.R.C.P. (London), with a foreword by the late Professor A. J. Clark, B.A. (Cambridge), M.D., D.P.H., F.R.C.P. (London), F.R.S.; Fourth Edition; 1946. Edinburgh: E. and S. Livingstone, Limited. 9½" x 6½", pp. 942, with illustrations. Price: 30s. net.

"A Practical Handbook of Midwifery and Gynaecology for Students and Practitioners", by W. F. T. Haultain, O.B.E., M.C., B.A., M.B., B.Ch., F.R.C.P. (Edinburgh), F.R.C.O.G., and Clifford Kennedy, M.B., Ch.B., F.R.C.S. (Edinburgh), F.R.C.O.G.; Third Edition; 1946. Edinburgh: E. and S. Livingstone, Limited. 8½" x 5½", pp. 398, with illustrations. Price: 20s. net.

"Anatomy and Physiology for Nurses", by J. L. Hamilton-Paterson, M.D.; 1946. London: H. K. Lewis and Company, Limited. 8½" x 5½", pp. 184, with 102 illustrations. Price: 9s. net.

"Topley and Wilson's Principles of Bacteriology and Immunity", revised by G. S. Wilson, M.D., F.R.C.P., D.P.H., K.H.P., and A. A. Miles, M.A., F.R.C.P.; Third Edition; 1946. London: Edward Arnold and Company. In two volumes, 9½" x 6½". Volume I: pp. 1028, with illustrations; Volume II: pp. 1,140, with illustrations. Price: 60s. net (2 volumes).

"Anatomical Atlas of Orthopaedic Operations", by L. S. Michaelis, M.D.; 1946. London: William Heinemann (Medical Books) Limited. 9½" x 7½", pp. 68, with many illustrations, some coloured. Price: 25s. net.

THE FEDERAL MEDICAL WAR RELIEF FUND.

THE following contributions to the Federal Medical War Relief Fund have been received:

South Australia.

I. H. Jose, R. L. Verco, £20.
J. W. Clayton, L. W. Linn, E. A. H. Russell, H. H. E. Russell, J. Riddell, R. M. Glynn, £10 10s.
D. O. Crompton, C. Duguld, L. L. Davey, £10.
W. A. Grote, D. Parkhouse, £5 5s.
J. W. Sangster, £5.
H. R. Oaten, R. Greenlees, £3 3s.
D. T. Shortridge, £2 2s.
C. S. Kerr, £1 1s.
Total: £157 19s.

Tasmania.

A. Pryde, £13 13s.
J. Bruce Hamilton, £10.
L. H. Wilson, £1 1s.
Total: £24 14s.
Grand total: £10,581 11s. 11d.

Notice.

A SPECIAL MEETING of the honorary medical staff of Sydney Hospital, to which all medical practitioners are invited, will be held at 8.15 o'clock p.m. on Thursday, June 6, 1946, in the Robert H. Todd Assembly Hall, British Medical Association House, 135, Macquarie Street, Sydney. The meeting will take the form of a demonstration of gramophone recordings of cardio-vascular and respiratory sounds by Dr. E. H. Stokes.

SERVICES MEDICAL OFFICERS' ASSOCIATION OF NEW SOUTH WALES.

MEMBERS of the Services Medical Officers' Association of New South Wales are advised that a special general meeting will be held at 8 o'clock p.m. on Wednesday, June 5, 1946, at the Stawell Hall, 145, Macquarie Street, Sydney. Prospective members are also invited to attend. Attention is directed to a letter on the subject of the association in this issue.

THE "ROBIN MAY" MEMORIAL FUND.

A FUND has been instituted as a memorial to the five members of the University of Sydney Medical Society, John Ashley-Thompson, Richard King, George MacCallum, Archibald Pursell and Peter Whitehouse, who lost their lives in the *Robin May* tragedy of May 15, 1945. It is intended that the memorial will take the form of an annual prize to a student at the completion of his course for display of leadership and good fellowship rather than academic brilliance. Contributions may be forwarded to the *Robin May* Memorial Fund, c.o. the Treasurer, University of Sydney Medical Society, New Medical School, University of Sydney.

J. TARN,

Honorary Secretary.

Medical Appointments.

Dr. H. F. Hustler has been appointed medical officer, Central Board of Health Department, South Australia.

The following appointments have been made in the Royal Adelaide Hospital, Adelaide: Dr. A. F. Hobbs, honorary surgeon; Dr. S. Krantz, honorary assistant surgeon; Dr. A. S. de B. Cocks, honorary aural surgeon; Dr. R. H. von der Borch, honorary assistant aural surgeon; Dr. G. A. Hodgson, honorary assistant anaesthetist.

Dr. B. M. Carruthers has been appointed a member of the Southern Tasmanian Ambulance Transport Service Board, Tasmania, in accordance with the provisions of Section 5 of the *Southern Tasmanian Ambulance Transport Service Act, 1932*.

Dr. A. F. G. C. Christie has been appointed medical officer of health, Wagin Municipal Council, Western Australia.

Dr. Donald Peter Robertson has been appointed quarantine officer at Wallaroo, South Australia, under the provisions of the *Quarantine Act, 1908-1924*.

Diary for the Month.

- JUNE 4.—New South Wales Branch, B.M.A.: Organization and Science Committee.
JUNE 5.—Victorian Branch, B.M.A.: Branch Meeting.
JUNE 5.—Western Australian Branch, B.M.A.: Council Meeting.
JUNE 6.—New South Wales Branch, B.M.A.: Special Groups Committee.
JUNE 7.—Queensland Branch, B.M.A.: Branch Meeting (Bancroft Memorial Lecture).
JUNE 11.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
JUNE 11.—Tasmanian Branch, B.M.A.: Ordinary Meeting.
JUNE 13.—South Australian Branch, B.M.A.: Council Meeting.
JUNE 14.—Queensland Branch, B.M.A.: Council Meeting.
JUNE 18.—New South Wales Branch, B.M.A.: Medical Politics Committee.
JUNE 19.—Western Australian Branch, B.M.A.: General Meeting.
JUNE 20.—New South Wales Branch, B.M.A.: Clinical Meeting.
JUNE 20.—Victorian Branch, B.M.A.: Executive Meeting.
JUNE 25.—New South Wales Branch, B.M.A.: Ethics Committee.
JUNE 26.—Victorian Branch, B.M.A.: Council Meeting.
JUNE 27.—South Australian Branch, B.M.A.: Scientific Meeting.
JUNE 27.—South Australian Branch, B.M.A.: Council Meeting.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

New South Wales Branch (Honorary Secretary, 135, Macquarie Street, Sydney): Australian Natives' Association; Ashfield and District United Friendly Societies' Dispensary; Balmalm United Friendly Societies' Dispensary; Leichhardt and Petersham United Friendly Societies' Dispensary; Manchester Unity Medical and Dispensing Institute; Oxford Street, Sydney; North Sydney Friendly Societies' Dispensary Limited; People's Prudential Assurance Company Limited; Phoenix Mutual Provident Society.

Victorian Branch (Honorary Secretary, Medical Society Hall, East Melbourne): Associated Medical Services Limited; all Institutes or Medical Dispensaries; Australian Prudential Association, Proprietary, Limited; Federated Mutual Medical Benefit Society; Mutual National Provident Club; National Provident Association; Hospital or other appointments outside Victoria.

Queensland Branch (Honorary Secretary, B.M.A. House, 225, Wickham Terrace, Brisbane, B.17): Brisbane Associated Friendly Societies' Medical Institute; Bundaberg Medical Institute. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.

South Australian Branch (Honorary Secretary, 178, North Terrace, Adelaide): All Lodge appointments in South Australia; all Contract Practice appointments in South Australia.

Western Australian Branch (Honorary Secretary, 205, Saint George's Terrace, Perth): Wiluna Hospital; all Contract Practice appointments in Western Australia. All government appointments with the exception of those of the Department of Public Health.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

All communications should be addressed to the Editor, THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales. (Telephones: MW 2651-2).

Members and subscribers are requested to notify the Manager, THE MEDICAL JOURNAL OF AUSTRALIA, Seamer Street, Glebe, New South Wales, without delay, of any irregularity in the delivery of this journal. The management cannot accept any responsibility or recognize any claim arising out of non-receipt of journals unless such a notification is received within one month.

SUBSCRIPTION RATES—Medical students and others not receiving THE MEDICAL JOURNAL OF AUSTRALIA in virtue of membership of the Branches of the British Medical Association in the Commonwealth can become subscribers to the journal by applying to the Manager or through the usual agents and booksellers. Subscriptions can commence at the beginning of any quarter and are renewable on December 31. The rates are £2 for Australia and £2 5s. abroad per annum payable in advance.

